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The Changing Nature of Inequality in a Time of Institutional Transformation: An Examination of Between-Workplace and Between-Industry Income Inequality in a Set of Thirteen High-Income Countries

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by

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ABSTRACT

THE CHANGING NATURE OF INEQUALITY IN A TIME OF INSTITUTIONAL TRANSFORMATION

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This is a three paper dissertation examining between-workplace and between-industry income inequality and their relations with changing labor market institutions and economic structures since roughly the early the 1990s. All three papers use large scale administrative linked employer-employee panel data (LEEP) for multiple years (roughly, 1993-2013) for a set of countries that span North America, Western and Eastern Europe, and East Asia. In the first chapter, I examine country differences in levels of between-workplace income inequality. Countries strongly vary in levels of between-workplace inequality. I use fuzzy-set Qualitative Comparative Analysis to identify institutional configurations that lead to high levels of between-workplace inequality. Ultimately, I find three distinct configurations, and that all three configurations are mainly composed of items related to labor union dynamics such as between-union conflicts, collective bargaining coverage, or union membership concentration. The second paper looks at *trends* in between-workplace inequality rather than levels. I examine how labor union dynamics, employment institutions, and economic structure have impacted trends in between-workplace inequality. I find that many of these items significantly impact both between-workplace and within-workplace inequality, but that their effects tend to be stronger on between-workplace inequality. Finally, the last paper examines industry-level trends in low-wage work since the early 1990s for a set of European countries. Low-wage work has become increasingly important to study as income inequality has risen across much of Europe. Many European nations have likewise undergone significant shifts in their labor market institutions. Using earnings data from administrative sources, industry-level trends in the concentration of low-wage work since the mid-1990s are examined for six European countries (Denmark, Sweden, France, Germany, Czechia, and Slovenia). Previous studies found that low-wage jobs were less common in core industries such as manufacturing and plentiful in service sector industries such as retail. These early findings are broadly confirmed here, but significant industry-level variation in levels and trends in low-wage work are found across these countries. Industry-level trends in low-wage work are related to industry-specific industrial relations.

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INTRODUCTION

This is a three paper dissertation examining between-workplace and between-industry income inequality and their relations with changing labor market institutions and economic structures since roughly the early the 1990s. All three papers use large scale administrative linked employer-employee panel data (LEEP) for multiple years (roughly, 1993-2013) for a set of countries that span North America, Western and Eastern Europe, and East Asia.

In the first chapter, I examine country differences in levels of between-workplace income inequality. Countries strongly vary in levels of between-workplace inequality. On the high end for example, over 60% of Germany's income inequality occurs between workplaces. On the lower end, less than 30% of the Netherland's income inequality occurs between workplaces. I use fuzzy-set Qualitative Comparative Analysis to identify institutional configurations that lead to high levels of between-workplace inequality. Ultimately, I find three distinct configurations, and that all three configurations are mainly composed of items related to labor union dynamics such as between-union conflicts, collective bargaining coverage, or union membership concentration. The first configuration, which featured countries such as Germany, Hungary, or Japan, was characterized by conflicts and separate bargaining between unions, weak levels of collective bargaining coverage or Employment Protection Legislation for temporary contracts, or the absence of a strong centralization of authority by union/confederation leaders. These countries tended to fit into dualistic models of labor relations, in which industrial relations in different parts of the economy varied strongly in the strength and character of their institutions. Such dualism has generally taken the form of strong, privileged sectors (bolstered by strong union membership and strong protections for their workers) existing alongside weaker sectors characterized by poorer union strength and an overall lack of protections for workers. The

second configuration was composed of South Korea and France. Although the pairing might seem odd at first, however both countries possessed extremely divisive labor movements (showing both strong external and internal divisions) and the presence of very high EPL for temp workers. The high temp EPL in these cases was likely a function of the very high rates of temporary employment in these countries. The final path was the most puzzling. It featured only the country of Norway. Conflict between unions was again present, but here it was coupled with the lack of internal conflict (int) concerning unions and confederations, high temporary EPL (TEMP), high centralization of union confederation authority (CENT_C), and high bargaining coverage (BARG). In other words, it is a picture of a fairly solidaristic set of institutions in the typical Scandinavian style. Given that the other two Nordic countries in this study (Denmark and Sweden) had low levels of between-workplace inequality, Norway's presence here is surprising and ultimately requires more research.

The second paper looks at *trends* in between-workplace inequality rather than levels. Recent evidence has shown that rising between-workplace income inequality has become the dominant driver of rising income inequality, but less is known about the specific processes that have facilitated rising between-workplace inequality. I examine how labor union dynamics (e.g. declining union density), employment institutions (e.g. legal regulations around permanent and temporary work contracts), and economic structure (e.g. rising rates of globalization and the decline of the manufacturing sector) have impacted trends in between-workplace inequality. One can think of these inequality-generating (financialization, rising service sector employment, dregulation of EPL, etc.) or inequality-reducing (bargaining coverage, union density, manufacturing sector size, etc.) mechanisms. I find that many of these items significantly impact both between-workplace and within-workplace inequality, but that their

effects tend to be stronger on between-workplace inequality. In a second stage, I test how many of these mechanisms interact with union density and collective bargaining coverage. I find tentative evidence that the inequality-generating ability of many of the most important recent economic transformations (e.g. financialization, trade globalization) could be blunted by higher bargaining coverage or union density.

Finally, the last paper examines industry-level trends in low-wage work since the early 1990s for a set of European countries. Low-wage work has become increasingly important to study as income inequality has risen across much of Europe. Many European nations have likewise undergone significant shifts in their labor market institutions. Using earnings data from administrative sources, industry-level trends in the concentration of low-wage work since the mid-1990s are examined for six European countries (Denmark, Sweden, France, Germany, Czechia, and Slovenia). Previous studies found that low-wage jobs were less common in core industries such as manufacturing and plentiful in service sector industries such as retail. These early findings are broadly confirmed here, but significant industry-level variation in levels and trends in low-wage work are found across these countries. Industry-level trends in low-wage work are related to industry-specific industrial relations.

CHAPTER 1:
Institutional Pathways to High Between-Workplace Inequality: An Analysis of Thirteen High-Income Countries

Introduction

Economists have been aware that firm or workplace-specific components to wages exist in the labor market for some time (Davis and Haltiwanger 1991; Lazear and Shaw 2009). However, only recently have scholars in economics and sociology become aware of its importance to today's problems of income inequality. Recent research has sought to closely examine the workplace component of income inequality across multiple countries. The major finding is that that the bulk of rising inequality among advanced, industrialized nations has been driven by rising inequality between workplaces (Tomaskovic-Devey et al. 2020; Card et al. 2013; Song et al. 2019; Skans et al. 2009). Avent-Holt et al. (2019), for example, have shown for a set of 5 Western countries that workplaces are more central components to income inequality than occupations. In addition to comprising the bulk of rising inequality among advanced economies countries also vary substantially in their levels of between-workplace inequality. In countries such as Germany or Japan, inequality between workplaces accounts for close to 60% of all income inequality, whereas in the Netherlands between-workplace inequality contributes only around 30% of national income inequality (Tomaskovic-Devey et al. 2020). Understanding why countries vary so greatly in between-workplace inequality is the focus of this paper.

Research on between-workplace inequality has mostly focused on inequality trends rather than the relatively stable differences in levels that exist across countries. Mechanisms that have been proffered in the literature for rising between workplace inequality include union and collective

bargaining decline (Card et al. 2013; Tomaskovic-Devey et al. 2020), decentralization of wage bargaining (Wilmers 2019), declines in other labor market institutions that protect the bargaining power of lower-skilled workers (Tomaskovic-Devey et al. 2020), the growing dominance of "superstar" firms (Autor et al. 2020), and increased productivity-based sorting between firms (Lazear and Shaw 2009).

These mechanisms focus on change and may play some role in explaining persistent national differences in levels of between-workplace inequality as well. In this paper, I most closely follow Tomaskovic-Devey et al. (2020), Avent-Holt et al. (2019), and Card et al. (2013) by focusing on the role of labor market institutions and structural economic conditions. Understanding how these institutional characteristics are related to between-workplace inequality is particularly important in the time period analyzed, roughly the early 1990s through the 2010s, because many advanced, industrialized countries underwent significant institutional changes during this period (Baccaro and Howell 2017; Marginson 2015; Thelen 2014), including collective bargaining decentralization (Marginson 2015), union density decline (Wallerstein and Western 2000; Western and Rosenfeld 2011;), deregulation of temporary employment contracts (Emmenegger et al. 2012), and increases in the globalization of trade (Dreher and Gaston 2008). Understanding the complex relationship between these institutions and between-workplace inequality gives researchers insight into what scholars are beginning to recognize is one of the key aspects of income inequality today (Grusky 2020).

Much of the research on between-workplace inequality and institutions has tended to highlight the impacts of institutions one at a time. Wilmers (2019), for example, examined the role of bargaining centralization in between-workplace inequality among US manufacturing firms. An alternative way of thinking about this relationship, familiar in comparative political economy,

concerns “packages” or “configurations” of institutions. Here, the emphasis is on how multiple institutions interact with each other to form a type of institutional regime. Some prominent examples of this are Esping-Andersen’s welfare regimes (1990), Hall and Soskice’s varieties of capitalism (2001), and the notion of “institutional complementarity” (Amable 2016). Charles Ragin’s Qualitative Comparative Analysis methodology formally models this kind of logic by discovering unique combinations of institutions, which he calls “pathways”, that lead to an outcome.

This paper uses this configurational logic, emphasizing 1) that there may be different “pathways” to high proportions of between-workplace inequality and 2) these pathways are characterized by combinations of multiple institutions interacting together within a country or set of countries. The latter point can be explained with a short, hypothetical example. It is reasonable to assume that high levels of bargaining centralization (such as at the industry or national level) would be associated with low between-workplace inequality because the ability of individual workplaces to deviate income-wise from each other would be constrained. In a dualized economy, where “core” workers are institutionally protected and “peripheral” workers are not, bargaining centralization may if anything reinforce between-workplace inequality. “Core” workers could bargain better wages for themselves and worse wages for “peripheral” workers more effectively and with a wider scope than would be possible in more decentralized bargaining structures. High bargaining centralization coupled with a dualized economy would then be an institutional configuration that leads to high between-workplace inequality, while high centralization in the absence of dualization would lead to low between workplace inequality. The analyses below will show that sets of institutions interacting together create unique institutional packages that are associated with high between-workplace inequality.

I focus on the level of between workplace earnings inequalities in thirteen countries - Canada, Czechia, Denmark, France, Germany, Hungary, Japan, the Netherlands, Norway, Slovenia, South Korea, Sweden and the United States. Together, this set of countries spans much of the relevant political economic and institutional typologies evinced in much of the literature. These countries range from those with strong labor market institutions and coordinated economies (e.g. Norway) to those with unregulated and liberalized economies (e.g. the US). As such, it is a representative set of advanced, industrialized countries. These countries also possess a strong range in levels of between-workplace inequality.

I use the most recent year available in our analyses. I engage in this cross-sectional approach for several reasons. I am interested in the cross-country differences in levels of between-workplace inequality (as opposed to *trends* in between-workplace inequality). Since country differences in levels are fairly consistent over time, using a single year for each country is sufficient. I opt for the last year available simply because the most recent data available is likely to be most relevant for policy and other real-world matters. One could plausibly use the full dataset to engage in longitudinal, change-based analyses. Although longitudinal QCA methods are increasingly available, better methods for change analyses exist (e.g. error-correction models) and adding in an entirely different analysis on between-workplace inequality change over time is too much for a single paper. Instead, I investigate within-country changes in between-workplace inequality in the next chapter of my dissertation.

Between-Workplace Inequality

Between-workplace inequality occurs when workplaces differ in the average wages they pay their workers. This paper is primarily focused on the *proportion* of national earnings inequalities

that are between-workplaces. In other words, I examine how much of a country's total inequality is accounted for by differences in workplace average wages. I measure between-workplace inequality as a proportion of total income inequality. As such, between and within-workplace inequality are mathematical reflections of each other. When the proportion of between-workplace inequality is high, then within-workplace inequality is low and vice versa. I opt for this approach because it is a simple, intuitive way to see whether between or within-workplace inequality processes dominate in a given country. An examination of the proportion of between-workplace inequality is a fundamentally different question than how much total inequality exists in a country, or even how much between-workplace inequality (in terms of something like logged variance in earnings) exists. Countries with high proportions of between-workplace inequality do not necessarily have high levels of total inequality or high levels of between-workplace earnings variance; these are different ways of looking at income inequality, and they are not strongly correlated with each other. The graph below, for example, displays the levels of between-workplace, within-workplace, and total levels of earnings inequality, measured as the variance in logged earnings income. Countries with black outlines around their bars (e.g. Germany, Hungary) have high proportions of between-workplace inequality. There is no obvious relation between levels of total income inequality and proportions of between-workplace inequality, with the correlation between total income inequality and the proportion of between-workplace inequality being only about .17. The lack of any relationship between total inequality levels and the proportion of between-workplace inequality should not be particularly surprising. The dominant mechanisms which generate inequality do not necessarily have any relation to the total levels of inequality even among countries which are otherwise quite similar. Avent-Holt et al. (2019) for example found that income inequality has a much stronger association with

occupational differences in Finland compared to Denmark, where workplace processes were more dominant.

Further, there can be strong differences in proportions of between-workplace inequality even within similar types of countries. Norway's proportion of between-workplace inequality is above 50%, whereas it is quite a bit lower for the other Scandinavian countries of Denmark and Sweden. Germany and the Netherlands, sometimes grouped together as coordinated market economies, have strongly divergent between-workplace inequality measurements.

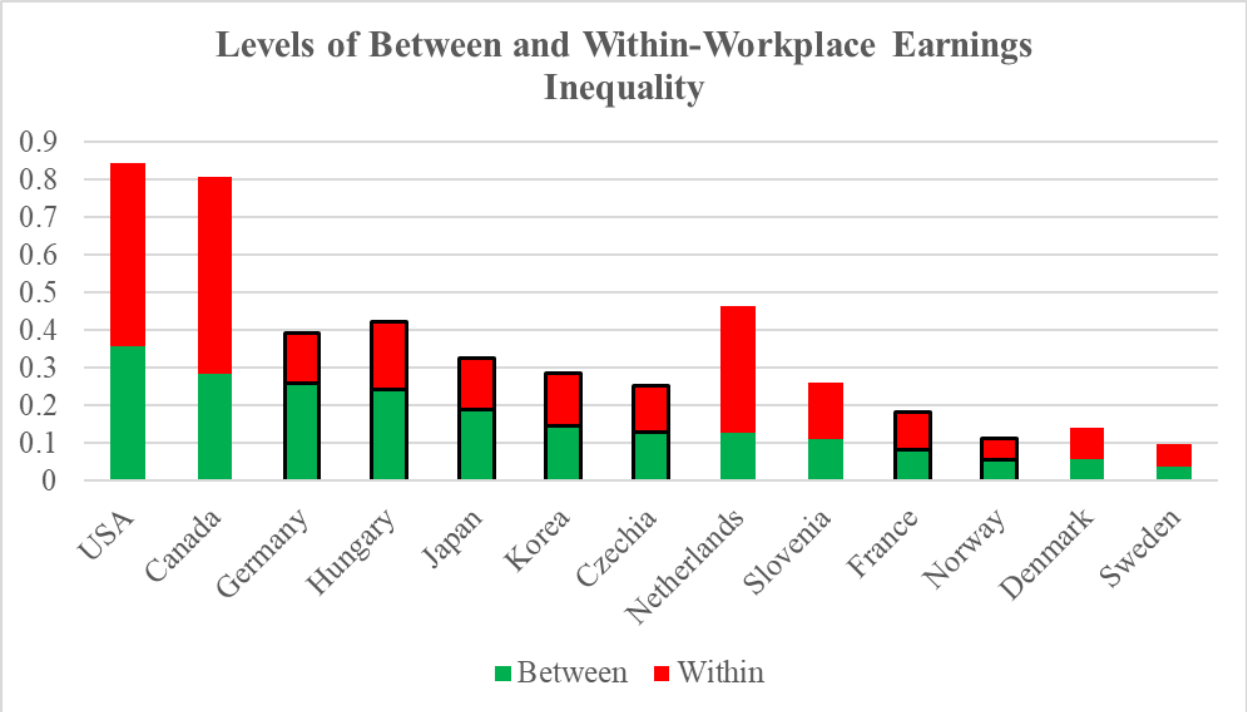

Figure 1: The graph displays between-workplace (green) and within-workplace (red) inequality, measured as the variance in logged income earnings. Total inequality is simply the sum of between and within-workplace inequality. Countries with black outlines around the bars have high *proportions* of between-workplace inequality.

Only one prior article examining the proportion of between-workplace inequality exists (Tomaskovic-Devey et al. 2020). Examining between-workplace inequality in a set of fourteen high-income countries across the world, that article found that countries varied widely in their levels of between-workplace inequality. In a country like Germany, over 60% of income

inequality occurs between workplaces. In neighboring Netherlands, it is less than 30%. A related article, focusing on six countries, found that more income inequality was explained by workplaces than by occupations in five of six countries (Avent-Holt et al. 2019). The degree to which inequality was explained by workplaces or occupations also varied significantly across countries.

A great deal of sociology (Baron and Bielby 1980; Acker 2006; Stainback, Ratliff, and Roscigno 2011; Tomaskovic-Devey and Avent-Holt 2019; Melzer and Tomaskovic-Devey et al. 2020) has stressed the importance of understanding how workplaces are implicated in income inequality. However, there have been few opportunities to more closely understand how workplaces function in the overall structure of inequality across countries. Understanding a basic question, does income inequality primarily occur between workplaces or within them, is an important step in furthering our understanding of both workplace inequalities and national inequalities more generally.

The key to understanding and fighting income inequality will be quite different in countries where inequality primarily occurs between workplaces compared to countries where within-workplace processes dominate. Policy solutions for cases where low-wage workers are sequestered and isolated in certain firms are going to be quite different than cases where workers across the income range can be found within workplaces. This is doubly so because understanding to what extent inequality is a between or within-workplace process also gets at the heart of many long-standing concerns social scientists have had. Residential and neighborhood segregation (between-neighborhood inequality), for example, has been associated with various social problems (Subramanian et al. 2005). In the United States, between-workplace racial segregation has been on the rise for several decades now (Ferguson and Koning 2018). Rising

between-workplace inequality would suggest that different types of workers are increasingly segregated into different types of workplaces, and indeed recent research has shown that this is the case (Godechot et al. n.d.). Research on the gender wage gap has sought to understand whether wage gaps are the results of a within-job (inherently within-workplace) wage penalty for women workers, or the result of men and women selecting into different workplaces (Petersen and Morgan 1995; Card, Cardoso, and Kline 2016).

Little prior research on between-workplace inequality exists, as researchers have only recently been able to gain access to the type of linked-employer-employee data that such analyses require. Research that does exist, has mainly focused on what drives rising between-workplace inequality within countries, and some plausible explanations have been offered. Some scholars have suggested that firms are increasingly sorting based on productivity, leading to a growing gap between higher and lower productivity workplaces (Lazear and Shaw 2009). The increasing ability of certain firms to subcontract and outsource work to supplier firms is also a likely source of rising between-workplace inequality, as companies concentrate on their "core competencies" and leave low-skilled and low-wage workers to concentrate into separate, contracting firms (Weil 2014). In the United States, some research has shown that rising between-workplace inequality is being driven by top-paying workplaces paying increasingly higher wages (Song et al. 2019). Card et al. (2013), among others (Skans et al. 2009), has additionally suggested that declines in labor market institutions related to collective bargaining coverage and union density have also contributed to increasing between-workplace inequality. Specifically, Card et al. identified part of Germany's growth in between-workplace inequality as the result of a proliferation of low-wage firms which have exited Germany's bargaining process or were born outside of it. Tomaskovic-Devey et al. (2020) have likewise noted a strong association between

rising between-workplace inequalities and declining institutional arrangements which protect or enhance the bargaining power of medium and low-skilled workers.

I follow this research by examining how sets of political economic aspects of national economies, implicated in past research on either between-workplace income inequality or income inequality more broadly, are related to high levels of between-workplace inequality. Whereas prior research has examined rising between-workplace inequality within individual countries, I examine cross-country differences in levels of between-workplace inequality. Although it is the case that between-workplace inequality is rising in most countries (Tomaskovic-Devey et al. 2020), fairly consistent differences in the level of between-workplace inequality also exist across countries. For example, both Germany and the Netherlands have seen strong growth in between-workplace inequality over the last several decades, but there is also a consistent, sizeable gap between these countries. The large variation in cross-country levels of between-workplace inequality suggests that how income inequality flows through a society greatly differs by country. In some countries, inequality seems to lie mainly in between-workplace processes, whereas in others within-workplace processes are dominant, and in others there is a more even mix of between and within-workplace inequality dynamics.

The study of levels of between-workplace inequality (as opposed to within-country trends) is much like the comparative literature often found in political economy. Clear distinctions exist between the liberal and coordinated market economies found in the VoC literature or between Scandinavian welfare states compared to those found in central Europe (as in the Esping-Andersen framework). The countries within these typologies are not static, sometimes moving closer to or farther from their initial "type," distinctions remain. For all of the discussion about Germany's shift towards liberalization (e.g. Baccaro and Howell 2017), for example, its political

economy remains distinctly separate from true liberal market economies such as the US and Canada, which are characterized by unregulated, free markets, and decentralized systems of industrial relations. Similarly, although between-workplace inequality is increasing almost ubiquitously across advanced market economies, countries clearly and strongly differ in how dominant between-workplace inequality processes are. Because the set of countries also run the gamut of institutional configurations in the VOC and welfare state traditions, I can also examine if they correspond at all to the institutional configurations that promote or reduce between-workplace inequality.

Political Economic Institutions

Here, I review the literature on relevant aspects of national economies and their associations with both between-workplace inequality and total levels of inequality. These aspects can be broken up into three broad conceptual categories: Employment Institutions; Labor Union Dynamics; and Economic Structures.

Employment institutions are aspects of the society that impacts the entire working population in a structural fashion. National minimum wage laws and legal employment legislation (EPL), for example, set the rules regarding wage limits and work contracts. Wage centralization captures the predominant level at which wages are bargained over for the working population (e.g. the national, industry, or firm level).

Labor union dynamics are those aspects which concern unions and collective bargaining specifically. This includes not only union density and bargaining coverage, but also ideological conflicts between unions, concentration of members across unions and confederations, and the power structure of unions and confederations.

Lastly, aspects of economic structure include such things as the size of the manufacturing/service sector, the level of financialization, or the level of trade globalization. These kinds of economic characteristics have been central in the literature on income inequality over the last several decades (Kollmeyer 2018; Godechot 2016; Tomaskovic-Devey and Lin 2011; Whitford 2005; Bergh and Nilsson 2010) but have remained unexplored in the between-workplace context.

The inclusionary or exclusionary function of an institution regarding workplace inequalities can vary depending on its relationship with other institutions. For example, unions can serve an inclusionary purpose by extending wage gains to as many workers as possible, even those workers, workplaces, or sectors which are not unionized; in contrast, in economies with strong dualization unions may be more successful in protecting core workers and less so for "peripheral" workers, thus facilitating between-workplace wage polarization. For some institutions, or combinations of institutions, there are strong theoretical links to between-workplace inequality. More decentralized collective bargaining structures, for example, should in general be associated with higher levels of between-workplace inequality. After all, moving from higher levels of bargaining centralization (i.e. industry-level) to lower ones (i.e. workplace-level) opens the possibility of larger income differences between workplaces. For other kinds of institutions such as XXXX, prior evidence shows that they are strongly associated with level of total income inequality in a country (Rueda and Pontusson 2000; OECD 1996;), but their relationship with between-workplace inequality is more ambiguous.

Employment Institutions

Centralization of Wage-setting

The centralization of wage setting refers to the level at which the process of setting wages in a country occurs. At the highest level of centralization, wages are set nationally. At the completely

decentralized level, any wage setting agreements would take place at the workplace or at the individual level. In between these two extremes, there are multiple versions of cross-industry or cross-sectoral wage-setting structures as well as some mixtures of sectoral/workplace wage-setting.

Income inequality is associated with more decentralized wage-setting, making wage-setting centralization an important factorin reducing inequality (Wallerstein 1999; Blau and Kahn 1999; OECD 1996; Rueda and Pontusson 2000; Alderson and Nielsen 2002; Kristal and Cohen 2007). As linked-employer-employee (LEE) data has become increasingly available, researchers have begun to explore the impact of wage-setting centralization on between-workplace inequality as well. Símon (2008), using the 2002 European Earnings Structures Survey, found that greater levels of wage-setting centralization was negatively associated with wage differentials between firms. Wilmers (2018) likewise found that wage-setting centralization among US manufacturing firms in the 1960s reduced income inequality between workplaces. Centralized wage-setting above the workplace level effectively constrains the ability of individual workplaces to either pay workers above the agreed-upon rate (even if in practice there is always some wage drift) or to cut labor costs by paying lower wages. The latter scenario is probably the more important of the two, as higher levels of wage-setting centralization have been shown to be particularly important for workers in the bottom half of the wage distribution (Pontusson, Rueda, and Way 2002).

On the other hand, other lines of research offer some suggestion that high wage setting centralization may be associated with between-workplace inequality under certain conditions. One branch of literature stresses how industrial relations can greatly vary across industries within countries (Bechter et al. 2011; Bechter et al. 2012). In countries such as Germany, for example,

sectors with strong labor institutions (e.g. high union density), as in most of the manufacturing sector, exist alongside relatively unorganized, weak industries largely located in the service economy (Schulten and Bispinck 2018). A related literature concerns the labor market dualization of employment legal protections (Emmeneggar et al. 2012). Here, legal employment protections (EPL) are much stronger for permanent work contracts than they are for temporary contracts. Dualized labor markets often map onto "core" and "peripheral" sectors characterized by strong and weak labor market institutions, respectively. Centralized bargaining at the industry level could feasibly exacerbate inequalities in dualized contexts. "Core" sectors would already be able to bargain more effectively than "peripheral" sectors, but the added EPL-related weaknesses of temp workers (often found in greater numbers in more "peripheral" sectors) increase this power discrepancy. Again Germany, featuring both large industry-level differences in industrial relations and strong labor market dualization, is emblematic of such a configuration. Strong manufacturing sectors directly benefit from the lower service costs of weak service sectors (Palier and Thelen 2010; Schulten and Bispinck 2018) and have often resisted efforts by service sectors to raise their standing, as in recent conflicts in Germany over instituting a national minimum wage (Dribbusch, Lehndorff, and Schulten 2017).

In sum, there are two ways to consider the relationship wage-setting centralization has with between-workplace inequality. The first emphasizes research that has shown a negative relation between centralization and between-workplace inequality. Here, wage-setting centralization constrains the ability of individual employers to pay workers higher or more likely lower wages than they otherwise would have, and thus reducing between-workplace wage differentials (Símon 2008). One can think of this as a linear relationship between centralization and between-workplace inequality. The second line of thinking emphasizes how wage centralization may

interact with certain kinds of exclusionary labor market institutions. Here, higher levels of wage centralization may be associated with higher between-workplace inequality in conditions of strong heterogeneity in industrial relations across sectors, or in heavily dualized labor markets. Although many CEE countries have established various corporatist or coordinated labor market institutions similar to those found in Western Europe (the actual effectiveness of which is still in doubt (Ost 2000)), wage-setting has generally been considered an individual matter and outside of the scope of labor actors such as unions (Pollert 1999). In the years following the Great Recession, wage-setting in most CEE countries either further decentralized as bargaining coverage and union membership continued to fall or saw an increase only in workplace-level wage-setting coordination (Bernaciak 2015). Japan and South Korea are both notable for the firm-centered nature of the political economies and workplace/firm-level bargaining regimes which benefit large firms over smaller and medium-sized firms (Thelen 2014). Denmark, France, Germany, and Sweden all possess institutions that mix sectoral/industry and workplace-level wage-setting, leaning more towards industry-wide settlements than workplace agreements. Western European countries have long been regarded for the predominance of industry-level wage coordination structures found in their economies (Crouch 1993). At the same time, such industry-level wage-setting has come under attack in recent decades (Marginson 2015), and as a result today many Western European countries have moved towards mixed industry/workplace wage bargaining. The final three countries, the Netherlands, Norway, and Slovenia, show the highest levels of wage centralization. As with the previous set of European countries, wage-setting is predominantly set at the industry level, but these three countries also periodically engage in cross-industry national wage bargaining.

Employment Protection Legislation (EPL)

EPL refers to the strength of regulations regarding regular (permanent) contracts and temporary contracts (including fixed-term work and temp agency employment). Across the 1990s and into the 2000s, many European countries began to gradually weaken their EPL, especially concerning temporary contracts, in a bid to reduce high levels of unemployment, especially among lower-skilled or lower-educated workers (Barbieri 2009; Barbieri and Cutuli 2016). As such, fixed-term and other temporary contracts have become more frequent across most European countries over the last few decades (McKay et al. 2012).

The association between EPL and between-workplace inequality is somewhat complicated. On the one hand, there is prior evidence (Tomaskovic-Devey et al. 2020) that stronger EPL for regular contracts is associated with higher levels of between-workplace inequality, while stronger EPL for temporary contracts was related to lower between-workplace inequality. This finding fits well with the literature on dualization, which suggests that strong/weak regular/temporary EPL in many European countries has created a protected class of core workers alongside a weaker, more exploitable set of peripheral workers. Regular and temporary workers are also often not spread evenly across the economy but tend to concentrate into distinct sectors or workplaces; service sectors such as hotels and catering, for example, in almost all countries possess more temporary contract workers than sectors like manufacturing (Gebel and Giesecke 2011). In some countries, temporary contract workers may also be concentrated in areas like healthcare, retail, or food processing (McKay et al. 2012). EPL may also be associated with between-workplace inequality because of "fissuring" (Weil 2014) and outsourcing processes. When temporary contract EPL is weakened, this almost always makes it easier for employers to hire workers through temporary employment agencies. The growth of temp agencies and other types of contracted-out labor are not only likely drivers of between-workplace inequality in and

of themselves (Tomaskovic-Devey et al. 2020), but also impact other institutional factors related to between-workplace inequality. Doellgast and Greer (2007; 2009), in an analysis of the German telecommunications industry, have shown how employers have used temp agencies and other forms of subcontracting to challenge, avoid, or otherwise weaken collective bargaining structures and agreements. Similarly, investigations of temp agency work in German manufacturing has found that subcontracting and other "fissuring" behaviors have disrupted industrial relations even in what is otherwise a highly coordinated, labor-friendly sector (Benassi 2016).

The above research suggests that strong regular EPL and weak temporary EPL would be associated with high between-workplace inequality. I should note however that some research suggests that this kind of labor market dualization may increase within-workplace inequality as well. Ochsenfeld (2018), for example, found that the wages of regular workers rise when the number of temp workers in the workplace increases, which should in turn exacerbate inequality within workplaces. Likewise, Tomaskovic-Devey and Melzer show that in Germany increased part-time labor raises between-workplace inequality and reduces within-workplace inequality among full-time workers (2020).

Sectoral Institutions

Corporatism has been of interest to political economists and others since the concept was developed in the early 1970s and has often been associated with labor market inequalities (Minnich 2003). There is some evidence that certain aspects of corporatist bargaining structures are related to between-workplace inequality (Tomaskovic-Devey et al. 2020, see appendix). I take from the literature the importance of strong sectoral institutions which are integral in structuring a corporatist economy. The presence of these sectoral institutions, such as peak labor

unions and or employer's associations, was for example a prominent feature in the corporatist, "tri-partite" bargaining structures commonly found in post-war Scandinavia and other European nations (Andersen, Dølvik, and Ibsen 2014). I am agnostic as to how sectoral institutions will be associated with between-workplace inequality.

National Minimum Wages

Legal minimum wages occurs in three main ways. At the highest level, there would a national minimum wage that applies equally across all sectors. France, for example, is notable for its high national minimum wage (Caroli and Gautié 2008). Alternatively, countries might have legal minimum wages for some but not all sectors. Often this occurs when certain sectors have become particularly vulnerable to issues of low wages and already- existing institutions (e.g. labor unions) have not been able to adequately deal with these issues. Lastly, some countries simply have no legal minimum wages at all. There are two ways one can look at how minimum wages might be associated with between-workplace inequality. One can imagine a situation where a national minimum wage might suppress between-workplace inequality because it simply places a hard floor on how much wages can differ. In many European countries, wages are bargained over at the industry level, and there are strong differences in the abilities of sectoral unions to bargain for good wages. Here, national minimum wages would suppress some of the wage variation that would otherwise occur. In France, for example, bargaining agreements in the service sector often settle for below the minimum wage, but the presence of the legal minimum wage overrides that wage settlement. In this scenario, a national minimum reduces the level of between-workplace inequality that would otherwise occur. Alternatively, the presence of a national minimum wage might be positively associated with high between-workplace inequality because it is often indicative of institutional shortcomings elsewhere. Several of the

Scandinavian countries, for example, do not have legal minimum wages because sectoral and other union actors are able to bargain for decent wages without the need for a legal minimum wage. The presence of a legal minimum wage (as has recently occurred in Germany) would then be indicative of a failure of other institutional actors to prevent unacceptably low wages. Of course, these low wage jobs would not be spread evenly across the economy (Rainey et al. 2020) but rather concentrated in areas marked by poor, disorganized union strength and so work to increase between firm inequality.

Union Dynamics

Collective Bargaining Coverage and Union Membership Density

Higher collective bargaining coverage and union density have long been associated with lower income inequality (Rueda and Pontusson 2000; Huber and Stephens 2014; Asher and DeFina 1997; Gustafsson and Johansson 1999; Gautie and Schmitt 2010; Bosch 2015). This is most notable in the Scandinavian countries, where both collective bargaining and union density have historically been the highest in the advanced, industrialized world (Esping-Anderson 1990). Studies looking at the relationship between union/bargaining coverage and between-workplace inequality have been rarer, but at least two have shown evidence that higher levels of coverage are associated with lower between-workplace inequality (Card et al. 2013; Tomaskovic-Devey et al. 2020).

Union and collective bargaining density often track closely together, but not always. In countries where collective bargaining mostly takes place at the workplace or firm level, as is the case in the United States or Israel for example, collective bargaining and union density tend to be quite similar. As bargaining moves into industry or national-level bargaining, strong divergences can emerge. In France for example, union membership has historically been exceptionally weak,

today hovering in the single digits. However, favorable extension laws, which allow bargaining contracts to be extended to workplaces with poor union representation, and union power in highly important sectors have led to collective bargaining coverage rates in the high 90s. Across much of Europe, the mixture of industry-wide bargaining agreements and contract extension mechanisms means collective bargaining density is higher than union density (ICTWSS).

Union Concentration, External/Internal Conflicts, and Authority

Most studies examining unions and income inequality have focused on union and collective bargaining density. In contrast, few have looked at the influence of other aspects of union influence, such as the concentration of union/confederation membership, conflicts between and within unions/confederations, or the level of authority unions/confederations have over their members. High concentration of union membership occurs when union members are clustered into a small number of unions. Low levels of concentration occur when members are scattered across many unions. Concentration is measured irrespective of the actual size of the labor movement. The scant studies that have done suggest that unions more effectively guard against wage inequality when union membership is more concentrated in a fewer, larger unions (Dolton and Robson 1996). When union membership is more concentrated, mobilization towards a target goal, as in wage-setting bargaining or job protection, is significantly easier. Concentration could also lead to more equitable wage-setting because high levels of union concentration mean that union leadership must deal with a broader group of worker interests, as workers in varying occupations and sectors will be members of the same union (Ebbinghaus 2004).

High union/confederation concentration was a significant part of classic tripartite bargaining structures found in corporatist countries such as Sweden. Head confederations or large, powerful sectoral unions (e.g. Sweden's LO or Germany's IG Metall) often lead the bargaining rounds

from labor's side. Significant membership concentration is key for such confederations to maintain legitimacy while leading the bargaining rounds. All of this suggests that high union/confederation concentration would be associated with low between-workplace inequality. However, this is most likely the case when high concentration is not coupled with counter-inclusive institutional settings such as strong ideological divides between union organizations or labor market dualization, which could undermine more inclusive or cross-class goals towards wage-setting, or even reinforce inequities between parts of the economy.

Conflict within or between unions certainly has the possibility of heavily eroding labor's power to maintain and enforce current collective agreements and work regulations. France is probably the most notable example of this. French labor union members are largely split among five state-sanctioned confederations; these confederations in turn have historically been quite divided along political and religious lines, as well as allegiances to the French state. This weakness has in turn often prevented unions from taking a more active role in labor issues such as enforcement of minimum wage or regulation of unemployment benefits (Howell 2009). Other notable examples include Germany, where IG Metall, the manufacturing-based union, and ver.di, the largest service sector representative, have for example at various points in recent history bickered over the introduction of a legal minimum wage (Hassel 2014; Carlin and Soskice 2009). The early 2000s Hartz reforms, which significantly deregulated EPL and introduced unemployment insurance cutbacks, also became a further source of union conflict when certain unions, such chemical worker's union IG BCE or the more conservative CGZP, broke with IG Metall and other powerful unions in backing these reforms. Scandinavian countries, on the other hand, have long been noted for the solidaristic and unified nature of their labor movements. Conflict and competition over union members and bargaining has generally been absent, with the exception of

Norway where some level of membership competition does occur (Dølvik 2009). The absence of between-union/confederation conflict has been highly important in allowing labor movements in these countries to maintain the high level of coordination across unions (Andersen et al. 2014).

Economic Structure

Manufacturing and Service Sector Size

The decline of the manufacturing sector across most advanced nations and the rise of the service in postindustrial economies have been frequent topics of discussion across political economic literatures. Declining manufacturing has been linked to issues such as rising income inequality (Kollmeyer 2018) and shrinking job opportunities for youth (Marques and Salavisa 2017) across many countries. The rise of the service sector has likewise been linked to troubling trends of low-wage, precarious employment (Esping-Andersen 1999; Kalleberg 2011). In the case of between-workplace inequality, I am interested in these two sectors because of their strongly different industrial relations profiles. Manufacturing sectors have long been characterized by powerful unions and coordinated bargaining, and in many countries manufacturing unions and confederations are still the backbone of labor strength (Bechter et al. 2011). In contrast, service sectors are notoriously disorganized and poor in union strength. Further, service sectors can often vary wildly in their industrial relations from country to country, whereas manufacturing tends to be much more homogenous across nations (Bechter et al. 2011; Bechter et al. 2012). For these reasons, one might expect large manufacturing sectors to be associated with low between-workplace inequality, and large service sectors to be associated with high between-workplace inequality.

Trade Globalization and Financialization

Globalization and financialization have factored into research on income inequality (Godechot 2016; Lin and Tomaskovic-Devey 2013; Barradas 2019). Early on, evidence seemed to show that globalization was associated with rising income inequality (Alderson and Nielsen 2002), and further advances in the field still support this association. Globalization has thus far not figured in much, if any, research on between-workplace inequality. One avenue in which globalization can factor into between-workplace inequality is through growing divides between export and non-export oriented parts of economy. Some research has shown that as exporting becomes more important to a nation's economy, there is an increase in the wage premium paid to workers in export-oriented workplaces (Klein et al. 2010). Economists have likewise theorized that trade liberalization associated with globalization will lead the most productive firms to move towards exporting (receiving wage increases in the process) and select out lower-productivity firms (Helpman et al. 2010; Egger and Kreickemeier 2010). Income inequality between export and non-export workplaces, facilitated by rising trade globalization, could feasibly result in high between-workplace inequality. On the other hand, evidence suggests that export-related divides also occur *within* workplaces as well. More specifically, evidence from Germany has found that high-skill workers benefit from increased wages in exporter workplaces, but lower-skilled workers suffer wage penalties. Thus, trade globalization may be associated with within-workplace inequality through the facilitation of skill-based income inequality within exporter workplaces. Globalization may more indirectly impact between-workplace inequality by eroding the bargaining and labor power of vulnerable, exposed sectors. In a more globalized economy, for example, employers can use the threat of relocation to suppress worker demands for fair wages and to erode union strength. Lower-skilled aspects of the production process can also more easily be outsourced outside of firms and to contracted companies in other countries.

Additionally, globalization has sometimes been found to be associated with a decline in the manufacturing sector, traditionally a sector characterized by strong labor unions and coordinated bargaining processes (Kollmeyer 2009).

Several studies have tied financialization to both growing income inequality (Lin and Tomaskovic-Devey 2013; Pariboni and Tridico 2019) and to disruptions in the strength and coordination of organized labor (Meyer 2019; Kollmeyer and Peters 2019) across advanced, industrialized economies. Financialization in and of itself can encourage employers to shift resources away from physical production (e.g. manufacturing) and towards financial means of profits. Declining manufacturing employment and investment can lead to declines in union density and labor power given that manufacturing sectors tend to be the seat of union power in most advanced, industrialized economies. Employees in finance are also rarely unionized themselves, so the simple increase in financial employment can lower union density (Hein 2012; Hein 2015). Financialization can also lower union and labor power because it facilitates related trends such as the privatization of parts of the public sector and labor market flexibilization (Barradas 2019). Privatization of a section of the public sector is usually associated with a loss in unionization (Hein 2012; Hein 2015). The strong incentive that financialization can put on short-term returns to investment, the rise of shareholder value, and related concepts also put pressure on employers to maximize labor flexibility and reduce labor costs. In this manner, financialization can facilitate the deregulation and the "fissuring" (Weil 2014) of firms as employers choose to outsource parts of the workforce to contracting firms Researchers have sometimes found stronger associations between financialization and income inequality among liberal market economies compared to more coordinated economies (Huber et al. n.d.). On the other hand, the time period analyzed was one in which many coordinated economies, in Europe

especially, very quickly financialized (Kollmeyer and Peters 2019); the speed at which this change occurred may mean financialization will have more of an impact on CMEs than the LMEs in our study.

Data and Methods

Data

I focus on between inequality dynamics in thirteen countries: Canada, Czechia, Denmark, France, Germany, Hungary, Japan, the Netherlands, Norway, Slovenia, South Korea, Sweden, and the United States. Together, these countries represent advanced, industrialized nations across North America, Western Europe, Eastern Europe, and East Asia. These countries also vary strongly in multiple labor market institutions. Countries range from having almost entirely unregulated labor markets with high degrees of wage-setting decentralization (e.g. the US, Canada), to highly coordinated economies featuring centralized collective bargaining systems (e.g. Denmark, Sweden), to so-called "dualized" countries characterized by severe differences in industrial relations systems depending upon industry or firm size (e.g. Germany, Japan). Some countries in this time period have seen real shifts in their labor market institutions, as in Sweden's move towards bargaining decentralization or Germany's serious decline in collective bargaining coverage. Others have gone in the opposite direction, building up their institutional strength, as in the so-called "new corporatist" state of Slovenia (Jahn 2012). Still others have maintained quite stable sets of labor market institutions (Denmark, Japan). All information on labor market institutions were collected from Jelle Visser's ICTWSS dataset unless otherwise noted. Table 1 below contains the descriptive statistics for all variables used in the fuzzy-set analyses.

Table 1: Descriptive Statistics of Dependent/Independent Variables - All Years

VARIABLES	N	mean	sd	min	max	p50
Year	222	2,004	5.538	1,993	2,013	2,005
Between Proportion Inequality	222	0.444	0.1	0.185	0.662	0.439
NORM	222	2.797	1.368	1	5	4
LEVEL	222	1.99	1.062	1	4.75	2.375
NMW	222	1.333	0.945	0	2	2
SECT	222	1	0.961	0	2	1
UD	219	31.03	22.08	7.794	84.54	22.17
BARG	177	49.88	31.14	11.92	100	36.88
EXT	222	1.755	0.568	1	3	2
INT	222	1.324	0.497	1	3	1
POWER_C	222	0.202	0.187	0	0.6	0.2
POWER_U	222	0.524	0.284	0.1	0.8	0.6
CONC_C	204	0.413	0.14	0	0.707	0.417
CONC_U	207	0.132	0.0648	0.01	0.267	0.125
CENT_C	207	0.225	0.174	0	0.473	0.248
CENT_U	207	0.252	0.117	0.0707	0.462	0.234
REG_EPL	222	2.097	0.845	0.257	3.306	2.341
TEMP_EPL	222	1.503	1.046	0.25	3.625	1.313
DUAL	222	0.594	0.953	-1.284	2.806	0.671
MANU	207	26.33	6.411	15.14	40.52	24.33
SERVICE	207	69.59	8.05	51.59	82.94	71.91
KOF_TRADE	222	66.68	13.5	31.81	87.24	69.22
KOF_FIN	222	75.15	12.73	31.83	91.64	79.19
STOCKS	207	67.01	59.44	0.857	321	52.31
TOTAL_INEQ	222	0.356	0.248	0.073	0.878	0.286

All countries possess high-quality, linked-employer-employee administrative data that allows for the decomposition of earnings into between-workplace and within-workplace components. Data were generally collected by and accessed through government entities such as Statistics Sweden or the German IAB (see appendix for specific details on each country's data sources). All employees aged 16 and over were included. Both full-time and part-time jobs were included. Jobs which had suspiciously low earnings were removed; generally, this was defined as jobs which earned less than 50% of the hourly minimum wage (see appendix for more information).

Data from all countries were either population-level or were composed of huge samples of workplaces and workers. For reference, the smallest sample size comes from South Korea in 2003 with 362,789 jobs and 52,085 workplaces.

These data contain highly accurate information on earnings, but they vary in how much information is present regarding hours worked. Earnings were transformed as close to hourly earnings as was possible. In most countries, either yearly or monthly earnings were initially observed and were then transformed into hourly earnings through information on hours worked. The exceptions are Germany and Hungary, where in the absence of information on hours worked daily earnings were used, and Slovenia and Sweden, where monthly earnings were used. Earnings were then log-transformed so that they would be scale-invariant (and thus comparable between countries) and easily decomposable into component parts. Afterwards, log earnings were decomposed into a between-workplace and within-workplace component of inequality for each country-year. I can then measure between-workplace inequality as the proportion of total logged earning inequality that is explained by the between-workplace component. The Appendix contains more detailed information on the data and sampling designs for all countries (see also Tomaskovic-Devey et al. 2020).

Methodology

This paper uses fuzzy-set Qualitative Comparative Analysis (fsQCA) (Ragin 2000) to search for institutional patterns consistent with high and low between workplace inequality. fsQCA has often been used in country-level comparative analyses, particularly when datasets can be characterized by a small-n problem (Emmenegger 2011; Avdagic 2010). There are several aspects of fuzzy-set Qualitative Comparative Analysis that make it an ideal method for this paper. First, fsQCA allows researchers to understand how *configurations* of variables lead to the

outcome one is analyzing, rather than estimating linear main effects as in typical parametric models. Conventional statistical analyses are mainly focused on the net effects of certain variables, the ability to statistical control for other factors, and statistical significance. fsQCA, in contrast, does not measure net effects or statistical controls. Rather, in fsQCA different combinations of variables (or factors) are tested for their ability to identify pathways to cases (here, countries). In this way, not all factors will be equally important for all cases. Like the method of cluster analysis and the generation of typologies as in the Varieties of Capitalism (Hall and Soskice 2001) or the Welfare State Regimes (Esping-Andersen 1990) literatures, fsQCA is focused on how a suite of institutional aspects work together to produce a certain outcome. In a sense, fsQCA attempts to bridge the gap between the kind of highly in-depth analyses found in qualitative case studies and the logical/mathematical rigor and broader focus of statistical studies.

Sets of labor market institutions may play important roles in one country but not in another. Countries have often taken different institutional paths towards similar endpoints (Thelen 2014). Given that the countries in this study represent a wide array of institutional arrangements, it is likely that there are multiple institutional configurations associated with between-workplace inequality. For example, labor union dynamics may play important roles in countries where large parts of the workforce are unionized or belong to bargaining agreements. In countries with low levels of union or collective bargaining, such dynamics may not be particularly important at all. Given that I suspect that there are likely multiple "pathways" to high between-workplace inequality, I need a methodology that will allow us to model the differential impact of factors across a diverse set of countries. Secondly, the data are in some respects still a "small n" dataset. While I have multiple years of observations for each country (the total number of country-years

is XXX), these are nested in just 13 separate countries. Given that many institutional aspects have changed either not at all or very little (e.g. regular EPL or national minimum wages), and what scholars know about the importance of path dependence in political economic research, it makes theoretical sense to treat this as a "small n" dataset. Fortunately, fsQCA is an ideal methodology for investigating complex solutions with small datasets (Emmenegger 2011).

In fsQCA, explanatory variables are measured by membership in "groups." Fuzzy set implies that cases can be completely in a group, completely out of a group, or somewhere in between (e.g. "more out than in" or "more in than out"). Each variable can range from 0 to 1, wherein "1" denotes total membership in a certain state and "0" denotes total absence. The anchors are not based on the highest/lowest scores found in the sample. Rather, researchers must use their own expert knowledge of the literature to determine what should denote full in/out membership. Let us use collective bargaining coverage as an example. Here, I want to construct a variable that represents high collective bargaining coverage. The Scandinavian countries have long been known to possess quite high levels of collective bargaining coverage, so it makes sense that one would use one of these countries for the full-membership anchor. Among the three Scandinavian countries in our dataset (Denmark, Norway, and Sweden), Norway has also been known to possess significantly less bargaining coverage than other Nordic countries. This would make Norway not an ideal candidate for the "fully-in" anchor. Denmark and Sweden both possess a more representative level of bargaining coverage. Denmark's coverage is at 83% and Sweden's is at 98%. I would then opt to use Denmark so as to ensure that both Denmark and Sweden have full membership in the set "high collective bargaining coverage." Both Denmark and Sweden would then be scored as "1" for this variable.. The United States, on the other hand, has a coverage rate of 10%, and so clearly gets a score of "0." Germany has a coverage rate of 55%.

That is still somewhat high, but clearly lower than Denmark's. In this case, I code Germany somewhere above .5 and below 1.0 to denote that they are more in the group than out of the group. Canada has a bargaining coverage of around 30%. That is higher than the US but still fairly low. Canada would be scored somewhere between 0 and 0.5 to denote that they are more out of the group than in.

Each dependent and explanatory variable can be transformed into a group membership score through a variety of means. Some researchers emphasize the use of expert knowledge to make qualitative judgements about group membership (sometimes called the "indirect" method) (Emmenegger 2011), whereas others also use a more mathematical approach (sometimes called the "direct" approach) (Ragin 2008). In this paper, I follow Ragin (2008) in using the direct transformation. In the direct transformation, scholars must first assign the 3 anchor points according to their knowledge of the cases. Then, the raw data are transformed by fitting them to a logistic function. Results tend to be robust using either direct or indirect methods as long as the most important components, the membership "anchors" of 0 (total non-membership), 1 (total membership), and 0.5 (the crossover point), are set correctly (Schneider and Wagemann 2012). Further, fsQCA-based comparative-historical analyses should always be done by closely consulting the in-depth literature on one's explanatory variables. Results from fsQCA analyses should thus be accompanied by qualitative discussions of clear examples of the identified pathways. As Emmenegger, Kvist, and Skaaning (2013) warn, absenting such discussions mutes the full ability of fsQCA to clearly identify causal configurations that lead to the phenomenon under examination. In this way QCA shares a qualitative logic with comparative case historical methods.

The first stage in a QCA analysis involves testing for the presence of "sufficient" and "necessary" conditions. A condition can be considered sufficient if whenever the condition occurs the outcome also occurs. For example, if every country that has high collective bargaining density also has low between-workplace inequality, then I could consider high collective bargaining density to be a sufficient condition for low between-workplace inequality. In other words, "if X, then Y." A condition can be considered "necessary" if whenever the outcome is present, the condition is also present. For example, if all the countries with high between-workplace inequality also have low collective bargaining coverage, then low bargaining coverage would be a necessary condition. In other words, "if Y, then X" (Schneider and Wagemann 2012). After testing for necessary and sufficient conditions, I move towards multi-condition models. In a fuzzy-set analysis of around 13 cases, best practices show that one should not include more than five causal factors in a single analysis (Marx 2006, Avdagic 2010). I run models consisting of 4-6 factors so that I can see if there are any 6-factor models that result in significant improvements to model fit. Ultimately, there were none, so I show only the best-fitting 4-5 factor models. In total, 177 models for high between-workplace inequality were ran, and 200 models for not-high between-workplace inequality were ran.

Calibration

All variables were calibrated following the "direct transformation" method (Ragin 2008). Here, the researcher establishes three anchor points equal to 0, 0.5, and 1 (representing "fully out," the crossover point, and "fully in" a set membership). Values are then calibrated as deviations in log odds from these anchor points. Anchor points were established using cases from the relevant literature when possible. If such literature was not available, variable means were used as crossover points. Although I am examining only the last year for which countries had

information on between-workplace inequality, calibration was done using the full dataset (which generally covered the period 1993-2013). Using the full dataset not only provides more information, but the transformation of some countries during this time frame can be very useful for establishing anchor points. For example, pre- and post-Hartz reform Germany can be useful for establishing anchor points related to strong temporary employment protection. Shifts in trade globalization scores in East Asia following the "opening up" of their economies can likewise be useful for establishing anchor points. Each condition has an abbreviation associated with it. Following common practice, *CAPITAL* letters denote the presence of the condition, and *lowercase* letters denote the absence of the condition. An explanation of how each variable was calibrated would be too large for the confines of a single article, so the appendix contains all information related to the calibration of each variable. Table 2 below however does show the calibration scores of each variable for each country.

TABLE 2: FUZZY-SET CALIBRATED SCORES OF ALL DEPENDENT AND INDEPENDENT VARIABLES

	CA	CZ	DM	FR	DE	HU	JP	NE	NO	SI	SK	SW	US
High Between Prop. Inequality	0.002	0.808	0.038	0.555	0.985	0.922	0.932	0.000	0.771	0.252	0.805	0.091	0.181
Not-High Between Prop. Inequality	0.998	0.192	0.962	0.445	0.015	0.078	0.068	1.000	0.229	0.748	0.195	0.909	0.819
COORD	0.047	0.047	0.953	0.269	0.953	0.047	0.953	0.953	0.953	0.269	0.269	0.953	0.047
LEVEL	0.047	0.047	0.580	0.702	0.580	0.047	0.047	0.702	1.000	0.873	0.047	0.643	0.047
NMW	0.953	0.953	0.047	0.953	0.047	0.953	0.953	0.953	0.047	0.953	0.953	0.047	0.953
SECTOR	0.047	0.047	0.953	0.731	0.953	0.047	0.047	0.953	0.953	0.953	0.047	0.953	0.047
UD	0.239	0.014	0.999	0.005	0.032	0.016	0.031	0.034	0.967	0.086	0.007	0.996	0.008
BARG	0.159	0.277	0.982	0.997	0.853	0.130	0.031	0.990	0.962	0.927	0.018	0.993	0.015
EXT	0.646	0.646	0.047	0.953	0.646	0.953	0.646	0.646	0.646	0.269	0.646	0.047	0.047
INT	0.646	0.047	0.646	0.646	0.047	0.047	0.047	0.953	0.047	0.047	0.646	0.047	0.047
CONC_C	0.912	0.971	0.077	0.030	0.999	0.017	0.823	0.763	0.150	0.013	0.141	0.208	0.151
CONC_U	0.016	0.508	0.602	0.338	0.694	0.000	0.043	0.687	0.584	0.008	0.243	0.598	0.001
POWER_C	0.047	0.269	0.953	0.269	0.047	0.047	0.269	0.953	1.000	0.269	0.119	0.953	0.047
POWER_U	0.997	0.536	0.988	0.047	0.997	0.828	0.047	0.997	0.997	0.536	0.047	0.953	0.997
CENT_C	0.000	0.651	0.760	0.028	0.000	0.000	0.521	0.976	0.986	0.011	0.006	0.896	0.000
CENT_U	0.570	0.398	0.930	0.040	0.988	0.050	0.030	0.987	0.947	0.159	0.038	0.874	0.320
REG_EPL	0.039	0.987	0.587	0.799	0.953	0.414	0.117	0.978	0.750	0.930	0.785	0.931	0.007
TEMP_EPL	0.001	0.407	0.327	0.986	0.095	0.095	0.023	0.033	0.953	0.095	0.777	0.016	0.001
DUAL	0.769	0.935	0.813	0.024	0.942	0.829	0.708	0.967	0.119	0.934	0.608	0.962	0.503
MANU	0.044	0.999	0.034	0.090	0.841	0.968	0.478	0.003	0.055	0.971	0.436	0.037	0.011
SERVICE	0.980	0.035	0.980	0.962	0.850	0.463	0.882	0.995	0.977	0.069	0.784	0.982	0.992
KOF_TRADE	0.695	0.988	0.992	0.936	0.980	0.996	0.481	0.997	0.945	0.993	0.959	0.986	0.630
KOF_FIN	0.970	0.976	0.988	0.983	0.979	0.990	0.923	0.994	0.982	0.788	0.745	0.990	0.964
STOCKS	0.905	0.003	0.172	0.566	0.499	0.049	0.994	0.773	0.035	0.001	0.997	0.944	1.000
TOTAL_INEQ	0.966	0.159	0.047	0.076	0.504	0.564	0.312	0.648	0.033	0.174	0.218	0.027	0.975

Results

In the first step, I ran tests to determine if any one causal condition was either a "sufficient" or "necessary" condition for high between-workplace inequality. Ultimately, no single condition passed either bar, although external conflict between unions came closest to sufficiency (one will see below that it is by far the most important condition in the final models) (results for single-condition tests for sufficiency and necessity available on request). After testing for sufficient and necessary conditions, I moved towards multi-causal condition analyses. Models were ranked on their consistency and coverage scores. Consistency is a measure of how *consistently* a solution set (or model) explains the outcome.

To take a hypothetical example, if the solution set "high bargaining coverage + low wage-setting coordination" was associated with high between-workplace inequality countries and only those countries, then the consistency score would be high. If the set "high bargaining coverage + low wage-setting coordination" was just as likely to be found among high between-workplace inequality countries as it was among countries without high between-workplace inequality countries, then consistency would be low. Generally, models should have a consistency score of at least 0.8 (although some scholars have proposed higher levels as well). The models reported below all have consistency scores well above that. Coverage is a measure of how many cases were explained by the models. In this manner, it is somewhat akin to the R^2 of standard regression models.

There were 22 separate variables entered into the models. Because each model can have between four and five conditions in it, there is an astronomical amount of possible combinations of these variables (roughly between 7,300 and 26,000 combinations). Testing every possible combination is not feasible, so I first test models made entirely from factors taken from each of the three main

groups of factors (employment institutions, union dynamics, and economic structure). I then take the most promising of each of these models and add in factors from other groups in an iterative fashion. Because fsQCA is an asymmetrical method, I engage in this process both to predict membership in the set "high-between workplace inequality" and the set "not high between-workplace inequality" (i.e. Y and not-Y) separately.

It is important to note here that "not high between-workplace inequality" is not synonymous with "low between-workplace inequality:" it simply denotes the absence of high between-workplace inequality. In total, 177 separate models testing the outcome "high between-workplace inequality" and 200 models testing the outcome "not high between-workplace inequality" were run. Table 3 below presents the results for the top 3 best performing models predicting membership in the set "high between-workplace inequality." Models were chosen based on the average of their consistency and coverage scores.

High Between-workplace Inequality

Both of the top models contain factors related to labor dynamics. External conflict between union confederations, internal conflict within union confederations, measures of numerical labor strength (union density or bargaining coverage, and measures of numerical concentration or concentration of statutory powers are common across all three models). Model 1 also contains employment institutions related to temporary contract EPL. Both models perform well, but ultimately Model 1 has a slight edge in terms of overall consistency (.909) and coverage (.792). Additionally, all high between-workplace countries are explained fairly well by the Model 1 configurations, with the sole exception of France. Model 1 is composed of four paths. All four paths have one factor in common: the presence of external conflict between union confederations

(EXT). Paths A and B have the highest coverage rates, both above .4, whereas paths C and D have coverage rates of .234 and .164 respectively.

TABLE 3: HIGH BETWEEN-WORKPLACE INEQUALITY

	Labor				Employment		
Model 1							
	Consistency = .909	Coverage = .792					
Path A:	barg	EXT	int		temp	=	HU,CZ,JA
Path B:		EXT	int	cent_c	temp	=	HU,DE
Path C:		EXT	INT	cent_c	TEMP	=	SK,FR
Path D:	BARG	EXT	int	CENT_C	TEMP	=	NO
Model 2							
	Consistency = .933	Coverage = .750					
Path A:	barg	EXT		conc_c	power_c	=	HU; SK
Path B:		EXT	int	CONC_C	power_c	=	CZ; DE; JA
Path C:	BARG	EXT	int	conc_c	POWER_C	=	NO

Note: Capital letters denote the presence of the condition, whereas lower case letters denote the absence of the condition. EXT = high external conflict between unions; INT = high internal conflict within unions; TEMP = high temporary employment protection legislation; CENT_C = high centralized authority of union confederations; BARG = high collective bargaining coverage; CONC_C = high concentration of union members in confederations; POWER_C = high statutory powers of union confederations.

Focusing on Model 1, paths A and B are both characterized by the presence of high external conflict between union confederations (EXT), the lack of internal conflict within union confederations (int), and the lack of strong EPL for temporary contracts (temp). The chief difference is that path A combines this with the absence of high bargaining coverage (barg), and path B with the absence of high centralization of union confederational authority (cent_c). Path A explains the cases of Czechia and Japan, and path B explains Germany. Hungary falls into both paths A and B, leaving it uncertain whether the absence of high bargaining coverage or the absence of high centralized authority plays a stronger role. Altogether, these two pathways contain countries marked by various kinds of labor market dualization, suggesting that this is a source of high between-workplace inequality.

All four countries notably lack strong protections for temporary contracts. The presence of external conflicts between confederations, especially in situations where collective bargaining is not universal or confederations do not have much authority over their members, also likely means that different unions and confederations are able to compete against and undermine each other. The formerly unified lead Czechian trade confederation (ČSKOS), for example, quickly broke up into rival factions when the new post-independence government came into power and did not grant confederations much statutory control over their members (Myant 2019). It is also notable that at least three of these countries (Czechia, Germany, and Hungary) also possess strong sectoral differences in their labor market institutions (Bechter et al. 2011). Germany for example is a classic example of a country with a strong, protected manufacturing core and an unorganized, weak service sector. Ideological divides and conflict between industrial and service sector unions has also characterized German organized labor for years. Recent debates surrounding the introduction of a legal minimum wage in Germany can provide an important example. Service sector unions have long emphasized the need for a statutory minimum wage in Germany as a means of protecting against low-wage work in these sector (Thelen 2014, pg. 56). Unions representing core industrial workers such as IG Metall and the IGBCE (representing chemical workers) had long resisted these calls. Some scholars have argued that persistent lower wages in the service sector benefit export-oriented manufacturing industries through lower service-related costs and taxes and through increases in real wages for insider workers in these core sectors (Hassel 2014; Carlin and Soskice 2009). One of the consequences of this is that Germany has one of the strongest divides in incidence of low-wage work between manufacturing and service sectors like retail and hotels/restaurants (Rainey et al. 2020). Conflict within sectors can also be found. In the case of the 2000s Hartz reforms, for example, industrial unions

responded quite differently. Some unions, such as IG Metall, were staunchly opposed to the proposed changes, whereas other industrial unions, such as chemical workers' union (IG BCE) and the conservative temporary work/personal services union CGZP, were open to the reforms. In Hungary, collective bargaining and other labor institutions have been under attack by several right-wing led governments since beginning its transition towards a market economy in the early 1990s. As such, collective bargaining coverage has been significantly eroded over the decades, especially in sectors such as hotels or construction (where union density now hovers in the low single digits (Borbély and Neumann 2019). Lead actors in right-wing governments have also successfully pitted different unions against each other. In the public sector, for example, the government has intentionally favored certain workers and their unions over others in order to foment conflict within the wider labor movement. In other cases, only certain union confederations have been invited as partners in tripartite practices, leaving others out in the cold (Borbély and Neumann 2019). Altogether, the labor movement in Hungary is currently disorganized, weak, and fraught with inter-union conflicts. Only certain sectors of the economy (examples) still maintain enough strength to bargain effectively. In this sense, Hungary is not dissimilar from Germany, and much like Germany the proportion of between-workplace inequality is exceptionally high. In Japan, fault lines along labor market institutions relate more to firm size, in which large firms have fairly organized institutions and workers benefit from stronger protection whilst smaller firms exist in a more unprotected, disorganized institutional landscape.

Path C, like path B, combines high external conflict (EXT) with the absence of high centralized authority (cent_c), but also contains the presence of high internal conflict (INT) and high temporary contract EPL (TEMP). Path C explains two countries: South Korea and France. South

Korea has often been characterized as a dualized country in much the same way as Japan; it is a firm-centered kind of dualization in which large, powerful firms dominate weaker, smaller ones (Peng 2012). South Korea differs from Japan in that there is internal conflict among unions and there is a high level of EPL for temporary workers. France also belongs to path C. France has long been noted for its highly fractured and combative unions, who have had as much trouble working with each other as they have with management (Howell 2009). Thus, the presence of external and internal conflict is no surprise. France also has very strong EPL for temporary contracts. One might think that strong temporary EPL would, if anything, undermine high between-workplace inequality in France and South Korea, given that high temporary EPL has previously been linked to lower between-workplace inequality (Tomaskovic-Devey et al. 2020). However, the reason France's temporary EPL is so strong is because the number of temporary contracts in France is exceptionally high. Likewise, the use of temporary contracts is quite widespread in South Korea. Additionally, a series of reforms following the 1997 Asian financial crisis both increased the amount of temporary workers and inhibited labor and state actors from properly regulating these kinds of contracts (Shin 2013). Further reforms to improve labor standards related to temporary contracts seem to have proven largely ineffective as South Korean firms have managed to skirt around these reforms by replacing now-protected types of temp contracts with still-unprotected kinds of temporary contracts (Baek and Park 2018). Additionally, temporary workers have traditionally not been able to join unions, and employers used the hiring of more temporary workers to weaken union strength (Shin 2013). Overall Path C suggests that high levels of temp regulation do not necessarily inhibit high between-workplace inequality. If the use of temp workers remains high, then even with *de jure* protection under the law, between-workplace inequality may be exacerbated. Such a situation could be made worse by a divided or

fractured union movement that does not have the strength to extend protections to more vulnerable workers.

Path D contains only Norway. Like paths A and B, path D is characterized by the presence of external conflict (EXT) and the lack of internal conflict (int) concerning unions and confederations, but also combines this with high temporary EPL (TEMP), high centralization of union confederation authority (CENT_C), and high bargaining coverage (BARG). The Norwegian case is interesting. First, the other two Scandinavian countries in this study, Denmark and Sweden, do not possess high proportions of between-workplace inequality at all. Secondly, Norway, like many Scandinavian countries, possesses a great deal of solidaristic institutions that one would generally expect to reduce between-workplace inequality. High temporary EPL prevents labor market dualization for example, and it is the case that Norway has resisted dualization tendencies better than other Scandinavian countries (Svalund and Berglund 2018). Likewise, collective bargaining coverage, at 72.5%, is certainly high enough to reach a strong majority of workers, and unions are encompassed inside large confederations with strong statutory powers. In short, Norway seems to possess a solidaristic, wide-reaching, and coordinated labor movement, typical of Scandinavian political economies. Perhaps the key difference is that Norwegian trade confederations sometimes do compete with each other over members and engage in separate bargaining (Dølvik 2009). Still, of all the high between-workplace inequality countries identified here, the Norwegian case is probably the most puzzling. Another possible explanation lies in problems Norway has recently had with enforcing bargaining agreements in certain sectors. Migrant workers from CEE countries tend to concentrate in particular sectors in Norway, such as construction, fishing, or XXX, and unions have had increasing difficulty in preventing employers from paying these workers wages below

that negotiated by bargaining contracts (Dølvik and Marginson 2018). Thus, between-workplace inequality may be high because of actions that are occurring beneath the formal institutional framework.

If I were to include model 2 in this analysis, I would find that our conclusions generally remain unchanged. Model 2 contains three of the same items as Model 1 (external conflict, internal conflict, and collective bargaining coverage). Further, the Model 1 item "CENT_C" is replaced in Model 2 with its constituent items "CONC_C" and "POWER_C" (representing membership concentration of confederation and statutory powers of confederations, respectively). The chief difference is the lack of a measure of temp contract EPL, and the fact that France does not appear in any of the configurations identified by Model 2.

Not-high Between-workplace Inequality

Table 4 below presents the results for the top 2 models predicting non-membership in the set "high between-workplace inequality." Both models again heavily feature union/confederation-based factors, with the addition of one employment institution in Model 2. Model 1 consists entirely of several union/confederation factors. Model 2 features a similar set of union/confederational factors as Model 1, but also includes a measure of wage-setting norms and agreements. Model 3 features only the union/confederation factors present in Model 2. Both models have identical coverage rates (.782), but Model 1 has a slightly higher consistency rate over Model 2 (.934 and .929 respectively). All not-high between-workplace inequality countries are well-explained by the Model 1 configurations. Compared to the set "high between-workplace inequality," the pathways identified for "not high between-workplace inequality" are overall more varied in their conditions, and there is no common condition, present or absent, across the four pathways found in Model 1.

TABLE 4: NOT HIGH BETWEEN-WORKPLACE INEQUALITY

	Labor				Employment			
Model 1								
	Consistency = .934		Coverage = .782					
Path A:	BARG	ext		conc_c	POWER_C		=	DM; SW
Path B:		ext	int	conc_c	power_c		=	SL; US
Path C:	barg	EXT	INT	CONC_C	power_c		=	CA
Path D:	BARG	EXT	INT	CONC_C	POWER_C		=	NE
Model 2								
	Consistency = .929		Coverage = .782					
Path A:	UD	ext		CENT_U		NORM	=	DM; SW
Path B:	ud	EXT	INT	CENT_U			=	CA; NE
Path C:	ud	ext	int	cent_u		norm	=	SL; US

Note: Capital letters denote the presence of a condition, whereas lower case letters denote the absence of a condition. BARG = high collective bargaining coverage; EXT = high external conflict between unions; INT = high internal conflict within unions; CONC_C = high concentration of confederation members; POWER_C = high level of statutory power among confederations; CENT_U = high level of centralized union authority; NORM = high degree of wage-setting coordination norms and agreements.

Path A is characterized by the presence of high collective bargaining coverage (BARG), high levels of statutory power of confederations over their constituents (POWER_C), and the absence of external conflict (ext) and membership concentration among unions (conc_c). This pathway contains the two remaining Scandinavian countries, Sweden and Denmark. The combination of high collective bargaining coverage (BARG) and authoritative powers of confederation leaders (POWER_C), and the absence of external conflict (ext), helps create a largely solidaristic and cooperative labor movement. Finally, these two countries also lack high membership concentration in union confederations (conc_c). Although both Scandinavian countries today lack high levels of membership concentration in confederations, high membership concentration used to be one of the pillars of the Scandinavian model of labor institutions (Andersen et al 2014). Sweden in particular used to be characterized by the strong dominance of the LO, the main blue-collar confederation, which also served as the main Labor negotiator during national

bargaining rounds. Today, the dominance of the LO has been challenged with the rise of various white-collar confederations such as Saco. The spread of union members across more confederations has also meant that the LO no longer unequivocally leads the Labor movement in wage negotiations, as other unions have stepped up to challenge the LO's place in bargaining. Nonetheless, the institutional legacy of a strong, dominant LO has meant that they continue to play an outsized role (relative to actual membership numbers) in the bargaining process.

Path B is characterized by the absence of 1) high external conflict between unions (ext), 2) high internal conflict within unions, 3) high membership concentration among confederations (conc_c), and 4) high authoritative powers among confederation leaders (power_c). Both Slovenia and the United States fall into this path. Slovenia and the US make an odd sort of pairing, and this path is probably the least satisfying of the four paths identified in the model. On the one hand, the United States is the quintessential liberal market economy, with a highly unregulated labor market and a small, unorganized labor movement. On the other hand, Slovenia is considered to be much more of a corporatist state (Jahn 2012), with exceptionally high collective bargaining coverage and union membership, and an overall strong labor movement (Crowley and Stanojević). In terms of total income inequality, for example, the US is clearly much, much higher, and Slovenia's overall stronger labor institutions are likely an important explanation there. In terms of the between-workplace proportion of income inequality, the commonalities between the US and Slovenia are a little harder to puzzle out. It is true that in both countries confederations lack many statutory powers and are not particularly concentrated membership-wise, with Slovenian union members being split between 3 large confederations concentrated in quite different sectors of the economy and the US being dominated by small workplace unions). Slovenian labor market institutions have likewise been liberalizing for

several years now after ascension into the European Union (Stanojević and Poje 2019), with more workplaces opting out of bargaining contracts, lacking union members, or taking advantage of workplace-level bargaining underneath an ostensibly industry-level contract. Still, Slovenia's labor market institutions remain quite different from the US, with high bargaining coverage, stronger union membership, and bargaining that takes place mainly at the industry level.

Path C explains the single country of Canada. Although Canada and the US are often grouped together in various typologies, they are both liberal market economies for example, Canada is institutionally different from the US in a few ways. First, Canadian union members are highly concentrated into a few large confederations such as the Canadian Labour Congress. Second, there are external conflicts between Canadian confederations, which was absent in the American case of Path B. The presence of external conflict is interesting given that it was by far the most common element in the high between-workplace inequality pathways. The other characteristics in this model however likely go a long way in muting the effect of external conflict. First, bargaining coverage in Canada is quite low (as it also was in the US), so external conflicts between unions would affect only a small part of the working population to begin with. Further, confederations do not have many authoritative powers over their constituents. External conflicts between unions are not likely to lead to much at the national level in scenarios where unions cover a small portion of workers and confederations do not have much control over their member unions.

Finally, Path D contains only the Netherlands. The fourth path, like path C is characterized by the presence of high external conflict between unions (EXT) and high internal conflict within unions (INT), but also contains high collective bargaining coverage (BARG), high membership concentration of confederations (CONC_C), and high levels of confederational authority over

members (POWER_C). In short, the Netherlands remains a fairly coordinated economy dominated by large union confederations (and employer associations) often seen in central Europe. The presence of external conflict between unions is again notable, but its effect on between-workplace inequality may be muted in such an otherwise highly coordinated setting. It is notable that the largest confederation in the Netherlands, the FNV, is over 3 times larger than the next largest confederation (the CNV) and around 10 times larger than the second largest (the VCP) (Been and Keune 2019). The FNV in turn has traditionally been the key union actor in signing bargaining agreements. It is also the case that in the Netherlands employer associations are now stronger today than the unions, which may further blunt the extent to which conflicts and frictions between unions can effect the overall state of the Dutch institutional framework (Been and Keune 2019). Employers for now have preferred to maintain the kind of stable, coordinated bargaining structure that is characteristics of corporatist countries, although this is becoming less and less so.

Conclusion

Ultimately, there are no neat and tidy groupings of countries mapping onto previous typologies common in the political economic literature. Norway, for example, is a high between-workplace inequality country, whereas its close cousins Denmark and Sweden are not. Both liberal market economies, Canada and the US, were in the "not high between-workplace inequality" category, but they also fell into distinctly different pathways. This is not particularly surprising. Most of the associations scholars have with political economic typologies have concerned total levels of income inequality (e.g. liberal economies have high inequality, coordinated economies lower, Scandinavian models with lower inequality still). Understanding how much inequality exists in a country, however, is simply a different question than trying to understand how inequality,

however small or large it may be, is generated. I have tried to contribute to this second question by identifying several configurations of institutions that are associated with inequality generated by between-workplace processes.

The models for high between-workplace inequality and not high between-workplace inequality both shed some light on the relationship between institutions and between-workplace inequality and left us with future things to puzzle out. Concerning high between-workplace inequality, four of the countries (Czechia, Germany, Hungary, and Japan) fell into two different pathways both of which had clear associations with labor market dualization. These pathways were characterized by external conflict between unions, the lack of internal conflict within unions, the lack of strong EPL for temp contracts, and the lack of either high bargaining coverage or centralization of authority at the confederational level. Two of these countries, Germany and Japan, are well-known for their strongly dualized labor markets (Palier and Thelen 2010; Peng 2012).

In the German case, several of the most prominent unions in Germany, such as manufacturing's IG Metall and the service sector union ver.di, belong to the same confederation (the DGB), but the lack of confederational authority over its members ensures that it is unions, not confederations of unions, that are the key actors there. Conflict between manufacturing unions and service sector unions have often led to manufacturing unions using their greater organizational strength to maintain conditions favorable to them and unfavorable to other sectors (Dribbusch, Lehndorff, and Schulten 2017), creating strong between-workplace inequalities across sectors. Similarly, workers in temp contracts suffer from much weaker EPL than those in permanent contracts. These EPL divides further map onto between-workplace inequality because some sectors of the economy (e.g. services like retail or hoteling) have many more temp

contracts than core economic sectors. The end picture is an economy with a high degree of labor market dualization and a high level of between-workplace inequality. Both characteristics likely fundamentally stem from between-industry differences rooted in labor union strength and organization and strong inequalities between permanent and temporary work contracts. The Czech case seems to be fairly similar. Czechia is marked by strong between-sector differences in union strength and organization, much like Germany (Bechter et al. 2011; Bechter et al. 2012), and additionally suffers from low collective bargaining coverage as well. Further, issues of dualization related to low protections for temp workers have been found in the Czechian context (Myant 2019).

In Hungary, right-wing governments have succeeded in pitting unions against each other by favoring some unions over others (e.g. inviting only some unions in bargaining sessions and other forms of social dialogue), and the Hungarian labor movements is now overall weak and divided. Only unions in certain sectors still retain enough strength to bargain effectively. The Japanese case differs somewhat from the prior two countries because dualistic tendencies seem to originate less from industry-related dynamics and instead revolve around the power of huge firms to dominate Japan's economy at the expense of smaller workplaces (Peng 2012). Overall, there seems to be a clear association between high levels of between-workplace inequality and labor market dualization, a relationship prior research has also noted (Avent-Holt et al. 2019).

The most puzzling finding was the fourth path, which contained only Norway. Of the three Scandinavian countries studied here, Norway was the only one to possess high between-workplace inequality. Path 4 was characterized by the presence of external conflict between unions like the other three paths, but also contained high EPL for temp workers, high collective bargaining coverage, and high centralization of authority at the confederational level. In other

words, Norway is in many ways a coordinated economy relatively free of the dualistic tendencies seen in the other high between-workplace inequality countries. If I compare this to the first path in the "not high between-workplace inequality" models, which contains Sweden and Denmark, I find that this path shares similar aspects of a coordinated, less-dualistic configuration: namely high collective bargaining coverage, high levels of confederational authority, and a high level of wage-setting coordination. It is true that Denmark and Sweden lack external conflict between unions, which is part of the Norwegian pathway, but it seems unlikely that that alone is enough to lead to high between-workplace inequality. After all, external conflict was not found to be a sufficient or a necessary condition for high between-workplace inequality.

Regarding the "not high between-workplace" analyses, the identified paths were a bit more varied, with no real common aspect found across the paths. This is best evidenced by paths 3 and 4, containing Canada and the Netherlands. Canada and the Netherlands strongly diverge from each other in terms of their labor market institutions and political economy and fit into distinctly different typologies. Canada is an archetypal liberal market economy, and the Netherlands is a highly corporatist (Jahn 2012), highly coordinated, continental European economy. Nonetheless, Canada and the Netherlands possess the two lowest levels of between-workplace inequality across the entire study, with 35% and 27% of inequality occurring between workplaces respectively (Tomaskovic-Devey et al. 2020). Interestingly, both paths 3 and 4 contain the presence of external conflict and a high concentration of union members into confederations. In the Canadian case, this is combined with the absence of high bargaining coverage, and the absence of confederational authority. In a country where unions are effectively low in numbers and lack authority, workplaces may effectively be playing on an even field. In the Netherlands, I find that external conflict between unions is combined with high bargaining coverage, high

confederational concentration of membership, and high confederational authority. Here, external conflict exists, but it is also the case that the main Dutch confederation (the FNV) strongly dwarfs the next largest confederation, being some five times larger. So, the overwhelming concentration of union members into one confederation, coupled with strong statutory powers of confederations over their members, may blunt the impact of external conflicts on between-workplace inequality.

If I take the insights from both sets of models together, I am left with an interesting picture. Countries which are highly disorganized (low bargaining coverage, low control of unions/confederations over their members, decentralized wage-setting coordination) like the US or Canada and countries which are highly organized (high bargaining coverage, high levels of control of unions/confederations over their members, centralized wage-setting) like Denmark, Sweden, or the Netherlands generally fall into the various not high between-workplace inequality paths. These countries certainly strongly differ in terms of their actual levels of inequality. It is a well-known fact that highly organized countries like Denmark and Sweden are much less unequal than liberal market economies like Canada or the United States. Yet, all of these countries share a common feature in that income inequality is more of a within-workplace phenomenon than it is a between-workplace one. In the middle ground, where countries have mixtures of disorganized and organized features, I find high between-workplace inequality. In these countries, workplaces in certain sections of the economy have been able to earn significantly higher wages than in other parts of the economy as a result of external conflict between unions/confederations, coupled with 1) other inequality-generating institutions (e.g. a lack of high temporary contract EPL or high collective bargaining coverage) or 2) the absence of countervailing, inclusionary institutions which could blunt the impact of conflicts between

unions (such as high wage-setting coordination). Of course, even here there are exceptions. Norway certainly fits institutionally with the other highly organized countries, but nonetheless maintains high levels of between-workplace inequality.

Discussion

In this article I have tried to contribute to the growing literature on between-workplace inequality. I have shown that there are various configurations of institutions, historical "pathways," which work together to encourage or discourage high between-workplace inequality, and that different countries fall into different pathways. It is important to note that no political economic feature was found to be a sufficient or necessary condition for high between-workplace inequality. External conflict between unions came closest both in terms of necessity and sufficiency but could not quite clear the bar. Rather, paths to high between-workplace inequality are ultimately about combinations of various political economic features that interact with each other to create economies where workplaces strongly differ in the wages they pay their workers.

The identification of the institutional underpinnings of high between-workplace inequality is important for various reasons. First, rising between-workplace inequality is now the dominant, driving force behind the growth in income inequality (Tomaskovic-Devey et al. 2020). For those scholars and policymakers who want to globally address the problem of rising income inequality, a deeper understanding of how and why between-workplace inequality is created will be necessary. Secondly, the fact that pathways to both high and not-high between-workplace inequality relied on multiple institutional features means that future researchers will need to understand how institutions and other economic factors interact with each other. This is especially the case given that high and not-high between-workplace inequality countries do not

easily map onto common typologies in the literature such as liberal vs. coordinated market economies (Hall and Soskic 2001) or welfare regime types (Esping-Andersen 1990). Liberal market economies have a tendency to display proportionally low between-workplace inequality (although there were only two representatives in this paper), but coordinated market economies run the gamut from quite high (e.g. Germany, Norway) to low (e.g. the Netherlands, Sweden) between-workplace inequality. Likewise, countries within welfare regime classifications can also strongly differ in their levels of between-workplace inequality, as in the contrast between Norway and Sweden or Germany and the Netherlands.

Further, the dominance of labor and union-related factors in these analyses show that more research is needed on different aspects of how unions structure income inequalities. Conflict and inequalities within the labor movements of countries can have various sources, from direct disputes over bargaining goals to uneven concentrations of power in certain sectors of the economy or particular unions. As employers have increasingly engaged in business strategies that likely exacerbate between-workplace inequality (e.g. the rise of domestic outsourcing or winner-take-all markets), effects on between-workplace inequality are likely to be felt in situations where labor institutions are either too weak to push back on such employer demands or cooperate with employers in a bid to protect their own core interests. Much of political economic research has tended to use union or collective bargaining density as the sole measurement of union strength, but at various points external and internal conflicts between and within union, the concentration/fragmentation of union membership, and the levels of authority that union leaders wield, as well as union and collective bargaining density, all played important roles in the institutional pathways. A greater understanding of how all of these factors shape the solidaristic

or exclusionary tendencies of labor movements will be needed if scholars are to know how labor movements impact between-workplace inequality.

Research on between-workplace inequality is still in its infancy. Much of the research thus far has been limited to single-country case studies (Card et al. 2013; Song et al. 2019; Skans et al. 2009); in fact, I am aware of only a single multi-country between-workplace inequality study (Tomaskovic-Devey et al. 2020). The literature that does exist suggests that between-workplace inequality is related to multiple factors, including large-scale institutional changes (Tomaskovic-Devey et al. 2020), union and collective bargaining density (Card et al. 2013), and wage-setting coordination (Simón 2010) among others. However, research on between-workplace inequality has thus far proceeded primarily through standard regression analysis method. Such methods are useful for understanding the net effects of factors while controlling for theoretically important covariates, but they lack the ability to discover how complex configurations of factors can act together to form or facilitate social phenomena. The importance of understanding complex configurations becomes apparent when one notices that high (or not-high) between-workplace inequality countries do not possess any single common trait. Several between-workplace inequality studies have noted that higher collective bargaining coverage is associated with lower between-workplace inequality (Tomaskovic-Devey et al. 2020; Card et al. 2013), yet countries with high collective bargaining coverage can both be found possessing high (e.g. Germany; Norway) or low between-workplace inequality (e.g. Denmark; the Netherlands). Paths to high between-workplace inequality are not dictated by single institutional factors, but rather the presence (or absence) of multiple institutions. The importance of understanding complex configurations of institutions is of course not new to social science. Political economists and related researchers have long tried to categorize countries into various typologies (e.g. Esping-

Andersen (1990) or Hall and Soskice (2001)) based on the confluence of multiple institutional characteristics. Such endeavors have been exceptionally useful in discovering why, for example, Nordic countries have much lower levels of income inequality than other advanced, market economies. By using fuzzy-set Qualitative Comparative Analysis, I have tried to explore some of the possible institutional configurations that open up the space for high between-workplace inequality.

This paper does have its limitations. First, the analyses done here were cross-sectional, and so any claims about causality are not possible. Future research should take advantage of the longitudinal change many of these institutions have undergone in the last several decades in order to more clearly model the causal impact of institutional change on rising between-workplace inequality. Secondly, I have conducted analyses at the national level here. This is common practice in much political economic research, but future studies should move away from the national level and towards the industry level within countries. National-level LMIs are often aggregates of industry-level estimates, and LMIs often greatly vary across industries within countries (Bechter et al. 2011; Bechter et al. 2012). Even institutions that are ostensibly at the national level, such as national minimum wages or employment protection legislation, likely have disproportionate impacts in different industries and sectors. Many of the wide-scale economic changes I have referenced in this paper, trade globalization to name one, also have disparate effects on different industries. If scholars are to truly understand how between-workplace inequality is structured by labor market institutions, economic shifts, and other such phenomena, then we will need to begin modeling the kind of institutional complexity that occurs across industries.

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Appendix

Below, I discuss the calibration of each variable used in any of the models ran for this paper. See also Table 5 at the bottom of this section.

High Between-Workplace Inequality: Countries were coded fully out of set membership if their between-workplace inequality was less than 0.40. Countries were coded fully in set membership if their between-workplace inequality was 0.60 or greater. Both values were chosen because they represent a clear minority/majority of inequality occurring between workplaces in a given country. Because very little is known about average levels of between-workplace inequality across countries, I use the mean of this dataset (roughly .44) as the crossover point. In practice, only France is somewhat marginally inside the “high between-workplace inequality” set using this method, as all other high between-workplace inequality countries have between-workplace inequality scores of over 50%.

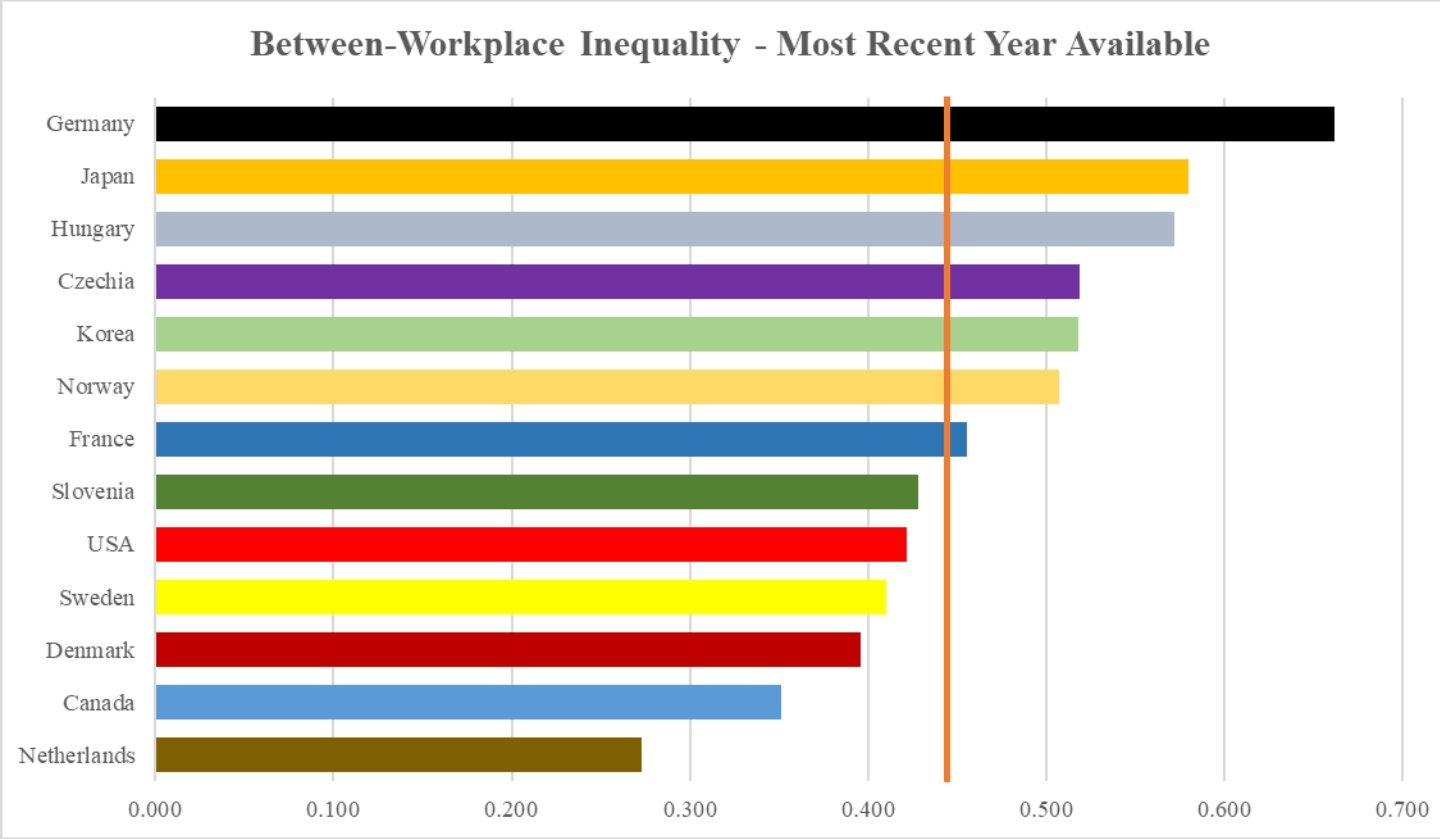

Figure 2: Proportion of between-workplace inequality for the most recent year available for each country. The vertical orange line is set at the cross-over point (0.444), which was the mean level of between-workplace inequality for the total dataset.

Wage Coordination (NORM; LEVEL): I tested two different measures of wage coordination: The first measures the level of binding norms and agreements that occur in the wage-setting process, which I refer to as "NORM." The second measures the actual level at which bargaining occurs (e.g. workplace, industry, cross-industry, etc.), I refer to as "'LEVEL." For "NORM," countries were fully out of membership if there was only fragmented, workplace-level bargaining present. Countries were coded fully in set membership when there were bargaining norms and guidelines fully in place emerging from either government/union recommendations or from regular bargaining from powerful union actors. The crossover point was set between "2" and "3" in the variable measurement, representing the presence of some wage-setting coordination but which is vague in quantity and scope and lacks general guidelines. For "LEVEL", countries were coded

fully out of set membership if their bargaining totally took place at the workplace level. Countries were scored as fully in set membership if their bargaining took place fully above the workplace level (e.g. industry-level or higher). The crossover point was anchored on mixed workplace-industry bargaining because it effectively falls somewhere in between total workplace bargaining and total above-workplace bargaining. Some above-workplace bargaining occurs in these settings, but it is unclear how much.

National Minimum Wage (NMW): Countries were coded fully out of set membership if they had no legal minimum wages at all. Countries were coded fully in if they had a national minimum wage that affected all sectors, industries, etc. The crossover point was set such that countries which had minimum wages that applied only to some industries or sectors were coded as "more out than in" set membership because such minimum wage laws likely do not affect the bulk of industries/sectors in a country.

Sectoral Institutions (SECT): Countries were coded fully out of set membership if they had no sectoral institutions at all for employers and unions. Countries were coded fully in set membership if they had strong sectoral institutions for both employers and labor unions. The crossover point was coded such that countries which possessed sectoral institutions for either labor or employers (but not both) were counted as "more in than out" of set membership but not fully in.

High Union Density (UD): Countries were coded fully out of set membership if they were less than 20% unionized. These encompassed notoriously poorly unionized countries like the US and France. Countries were coded fully in set membership they were over 50% unionized, which was based around the notably labor-strong Scandinavian states. The crossover point was set at 35%

union membership so that Canada, which is not heavily unionized but notable more so than other liberal market economies, would be more out than in the set "high union density"

High Collective Bargaining Coverage (BARG): Bargaining coverage was coded similarly to union density. Out was anchored on a score of 20% coverage, again reflecting labor-weak states such as the US. In was anchored at a score of 70% coverage to reflect the Scandinavian states. The crossover point of 40% coverage was chosen because it allows countries such as Germany, which has a high bargaining coverage but noticeably lower than Scandinavia, to fall "more in than out" of the set "high collective bargaining coverage", and countries such as Canada, which is bargaining poor but still higher than the typical LME, to fall "more out than in."

High External/Internal Conflict Concerning Union Confederations (EXT; INT): Both external and internal conflict regarding unions were coded as fully out of set membership if there was simply no conflict present. Fully in membership was anchored on the presence of sharp conflict which resulted in competition over members and influence. France is a good example of a country with a labor movement marked by strong discord between its various union confederations, who are divided along political and religious lines among other things. For external conflict, this would culminate in separate bargaining arrangements between union confederations. For internal conflict, this would culminate in multiple unions within the same company clashing with each other. Out was anchored on the absence of conflict. A Nordic country such as Sweden would be an example of a country where traditions of strong solidarity and high levels of cooperation across unions have largely prevented union conflict and competition from occurring. A crossover point was determined such that countries which had moderate levels of conflict between or within unions fell into the "more in than out" category.

High Union/Confederation Membership Concentration (CONC_U; CONC_C): These variables were measured at both the union and the confederation level. Membership concentration was calculated as a Herfindahl index. The Herfindahl (H_{CF}) index for union confederations ($H_{CF} = \Sigma_i^n(p_i{}^2)$) is given by the proportion of total membership organized by the I^{th} confederation where n is the total number of confederations. Effectively, it measures how concentrated or fractured union/confederation membership is. A score of 1 would mean that all union/confederation members belonged to a single union/confederation. Note that membership concentration is irrespective of the size of the labor movement in a country. Countries were coded as fully out of set membership when concentration was 0.1 (union) or 0.26 (confederation). These scores were based on countries such as the US, which is dominated by small workplace unions, and France, which possesses a notably fractured labor movement. Countries were coded as fully in when concentration was 0.6 (union) or 0.5 (confederation). These were based on continental European countries like Germany and the Netherlands, whose labor landscape is characterized by large unions (e.g. IG Metall or ver.di) and confederations (e.g. the DGB). The crossover points in both cases were centered on the variable means.

High Union/Confederational Statutory Power (POWER_U; POWER_C): These variables measure the statutory power unions/confederations have over their affiliates and local workplace branches/representatives. Higher levels mean unions/confederations have more control over members regarding issues such as wage-bargaining, workplace representatives, or strikes. Countries were coded fully out of set membership when they had scores of 0.1 (union) or 0 (confederation). Union scores were anchored on France, whose unions have notably weak powers, and confederation scores were anchored on Germany, where confederations have effectively no power. Fully in set membership was anchored on scores of 0.6 (union) and 0.4

(confederation). Union scores were again anchored on Germany, where powerful unions are the key labor actors instead of confederations. Confederation scores were based on the Scandinavian countries, where historical tripartite bargaining structures have given labor confederations extensive powers over their affiliates. Crossover points were set at the mean values.

High Union/Confederational Authority (CENT_U; CENT_C): These variables are summary measures of centralized union/confederational authority, calculated from membership concentration (horizontal coordination of the union movement) and statutory power (vertical coordination of the union movement). Mathematically, this indicator is calculated by multiplying CONC_U by POWER_U and then taking the square root of the product. By weighting both the horizontal and vertical coordination of the union movement in a country, this measure seeks to capture the level of centralized authority unions have over wage bargaining and other issues (Iversen 1999). For confederations, fully out membership was again anchored on the weak confederations of France, and fully in membership on Scandinavian confederations. For unions, fully out membership was anchored on the fractured unions of France. Fully in membership was anchored on Germany, which is notable for both strong membership concentration and statutory powers at the union level. The crossover points were anchored on the mean values.

High Regular/Temporary Contract Legislation (REG; TEMP; DUAL)): These variables are measures of the strength of employment legislation protecting workers in regular and temporary/fixed-term working contracts. Fully out membership for regular contracts was anchored on the US and Canada, both liberal market economies with exceptionally low levels of EPL. Fully in membership was anchored on Germany, which like many dualized continental European countries is known for having strong protections for “core” workers in these kinds of

jobs. The crossover point was anchored using the country of Denmark, which has a middling level of regular EPL owing to its flexicurity style of economy.

For temporary contracts, fully out membership was anchored on post-Hartz reforms Germany, as the Hartz reforms slashed temporary EPL and helped further the labor market dualization of Germany. Fully in membership was anchored on France, which has some of the highest temporary EPL in Europe. The crossover point was anchored on Sweden and Denmark, as these countries either a) struggle with more minor issues of labor market dualization or 2) engage in flexicurity strategies which entail middling levels of EPL.

I also took the difference between these two types of EPL to create a measure called "dualization" (regular EPL minus temporary EPL). Fully in set membership was based on post-Hartz Germany for reasons stated above. Fully out set membership was based on France, which has even higher temporary EPL than regular EPL. The crossover point was set at 0 because it represents a situation where regular and temporary EPL do not differ from each other.

Financialization (STOCKS; KOF_FIN): Financialization is somewhat difficult to define, and scholars have often employed different ways to measure it. I employ two measures of financialization. The first measure is based on the volume of stocks traded as a percentage of GDP (STOCKS). This measure was chosen following Godechot (2016), who found that much of financialization's impact on inequality was driven by the "marketization" aspects of finance. This measure is closest to the fissuring account (Weil 2014; Lin and Tomaskovic-Devey 2013) in which larger firms outsource production while keeping control of brand based earnings. Our second measure of financialization comes from the KOF measure of financial globalization (KOF_FIN). The KOF measure is based on the capital flows and stocks of foreign assets and the overall openness of a country to financial investments (Gygli et al. 2019). In both cases, fully out

membership is anchored on Canada around the mid-2000s. Canada was used because LMEs in general have typically had very high levels of financialization. The US could not reliably be used because the numbers were extraordinarily high compared to every other country in this study. Fully out membership was based on the Central Eastern European countries where financialization has not penetrated the economy to the extent it has in much of the rest of the advanced, industrialized world. The crossover point was anchored on either the late 1990s/early 2000s Japan or South Korea. This was the period in which these countries began opening up their domestic markets to foreign investment. I aimed to use the halfway point in this transformation as the crossover point.

Trade Globalization (KOF_TRADE): I use the KOF measure of globalization (Gygli et al. 2019). The KOF measure of trade globalization measures exposure to and engagement in global trade. It is composed of items such as 1) the long-distance exchange of goods and services (e.g. import/exports as shares of GDP; 2) the heterogeneity of trade partners; and 3) policies that facilitate trade between countries, such as trade regulation, tariff rates, or free trade agreements. Fully out membership is anchored on late 1990's Japan before they began opening up their economies. Fully in membership is based on the Scandinavian countries such as Sweden, who are known for having quite open economies. The crossover point was taken from early 2000s Japan and South Korea as they began moving to open up their economies to global trade.

Manufacturing and Service Sector Size (MANU; SERVICE): I also measure the relative employment size of the manufacturing and service sectors. Fully out membership for manufacturing was anchored on the low manufacturing sizes of modern-day service economies like the US, Denmark, or Canada. Fully in membership for manufacturing was anchored on Germany and the CEE countries, which still employ high proportions of workers in these sectors.

The crossover point was based on early 1990s USA, a period in which manufacturing employment was on the decline but had not yet bottomed out to the levels seen today.

TABLE 5: VARIABLE CALIBRATION MEASURES AND RATIONALES				
VARIABLES	**DESCRIPTION**	Out	Crossover	In
Dependent Variables	**Dependent Variables**			
High Between-Workplace Proportion	High proportion of income inequality occurs between workplaces	0.4	0.44428	0.6
Not-high Between-Workplace Proportion	Not high proportion of income inequality occurs between workplaces	0.6	0.44428	0.4
Wage Coordination	**Wage Coordination**			
NORM	High level of binding norms and agreements that occur in the wage-setting process	1	2.5	4
LEVEL	Actual level at which bargaining occurs (e.g. workplace, industry, cross-industry, etc.)	1	2.3	3
National Minimum Wage:	**National Minimum Wage**			
NMW	Presence of national minimum wages	0	1.5	2
Sectoral Institutions	**Sectoral Institutions**			
SECT	Presence of strong sectoral institutions for labor and employers	0	0.5	2
Union Coverage	**Union Coverage**			
UD	High union density	0.2	0.35	0.5
BARG	High collective bargaining coverage	0.2	0.4	0.7
Union Conflict	**Union Conflict**			
EXT	Presence of external conflict across unions/confederations	1	1.75	3
INT	Presence of internal conflict inside unions/confederation	1	1.5	3
Union Membership and Authority Concentration	**Union Membership and Authority Concentration**			

CONC_C	Measures how concentrated or fractured confederation membership is (i.e. one big confederation vs. many smaller ones)	0.26	0.414255	0.5
CONC_U	Measures how concentrated or fractured union membership is (i.e. one big union vs. many smaller ones)	0.1	0.13224	0.6
POWER_C	Statutory power confederations have over their affiliates and local workplace branches. Higher levels = more control over members regarding issues such as wage-bargaining, workplace representatives, or strikes	0	0.3	0.4
POWER_U	Statutory power unions have over their affiliates and local workplace branches. Higher levels = more control over members regarding issues such as wage-bargaining, workplace representatives, or strikes	0.1	0.39	0.6
CENT_C	Seeks to capture the level of centralized authority confederations have over wage bargaining and other issues. Mathematically calculated by multiplying CONC_C by POWER_C and then taking the square root of the product	0.23	0.3	0.4
CENT_U	Seeks to capture the level of centralized authority unions have over wage bargaining and other issues. Mathematically calculated by multiplying CONC_U by POWER_U and then taking the square root of the product	0.12	0.252392	0.39
Employment Legislation	**Employment Legislation**			

REG_EPL	Strength of employment legislation protecting workers in regular contracts	1	2.134921	2.678
TEMP_EPL	Strength of employment legislation protecting workers in temporary contracts	1	1.5	3
DUAL	Labor market dualization. Mathematically calculated as the difference between REG_EPL and TEMP_EPL	-1	0	1.67
Economic Structure	**Economic Structure**			
STOCKS	The volume of stocks traded as a percentage of GDP	20	35	84
MANU	Percentage of workers in the manufacturing sectors	20	25	30
SERVICE	Percentage of workers in the service sectors	60	65	75
KOF_TRADE	Exposure to and engagement in global trade	40	52	70
KOF_FIN	Based on the capital flows and stocks of foreign assets and the overall openness of a country to financial investments	40	52.285	74
TOTAL_INEQ	Total levels of income inequality	0.143	0.39	0.763

CHAPTER 2:
What is Driving Between-Workplace Inequality Within Advanced, Market Economies?

Introduction

Recent advances in Economics (Card, Heining, and Kline 2013; Skaans, Edin, and Holmlund 2009) and Sociology (Tomaskovic-Devey et al. 2020; Tomaskovic-Devey and Melzer 2020) have shown that most advanced, market economies have seen increases in between-workplace income inequality since at least the early 1990s. Further, the growth in between-workplace inequality has composed the bulk of rising inequality in this same time period, making between-workplace inequality a dominant driver of rising income inequality However, most research in this area thus far has been confined to single-country case studies; in fact, I am aware of only two articles on between-workplace inequality that utilize multiple countries (Tomaskovic-Devey et al. 2020; Avent-Holt et al. 2019). Single-country case studies have made valuable contributions to our understanding of what drives between-workplace inequality, especially when undertaking in-depth institutional analyses of how specific institutions drive between-workplace inequality in a given country (e.g. rising German between-workplace inequality has been linked to declining collective bargaining coverage among certain types of workplaces (Card et al. 2013)). However, such research has limited ability to generalize findings beyond the country under examination.

Since rising between workplace inequality appears to be a general phenomena, a search for general causes seems warranted. The discovery of more generalizable findings on what is driving between-workplace inequality is an important step for several reasons. A true understanding of the relationship between economic/social institutions and between-workplace inequality will

inevitably lead back to close readings of how institutions engage with between-workplace inequality in ways that are country-specific, both because institutions often manifest differently across different countries and because institutions can interact with each other in complex ways that make generalized predictions difficult. Having said that, some institutional effects are likely to be more uniform across countries than others (e.g. the well-known relationship between union density and income inequality) and the type of broad-based analysis conducted in this paper is a way to get at some of these more basic relationships. Second, a great deal of economic and institutional shifts of the last several decades have been fairly wide in scope, involving multiple countries and parts of the world. Economic changes such as deindustrialization and financialization, for example, have impacted almost every advanced, market economy in the world to some degree. Within the European Union, attacks on collective bargaining and wage-setting institutions have also been quite widespread (Marginson 2015), with most European countries seeing some amount of change in these institutions (e.g. the sharp decline in union density in Germany (ICTWSS) or the decentralization of bargaining contracts in Sweden (Baccaro and Howell 2011; Baccaro and Howell 2017). Generalizable findings are needed when economic/institutional phenomena have a certain generalizable character themselves. Lastly, the rise of supranational institutions like the European Union means that broad policy agendas will increasingly interact with local heterogeneity in important ways (a somewhat analogous idea might be the way that US federal policy interacts with state-specific environments). As such, these broader policy agendas must be informed by relatively generalized processes in local areas within these structures are to have any hope of adapting policy recommendations to localized context at all. In any case, the goal of this paper is to establish some general findings about the

relationship between social/economic institutions and rising between-workplace inequality. However, these findings must always be considered alongside more localized knowledge.

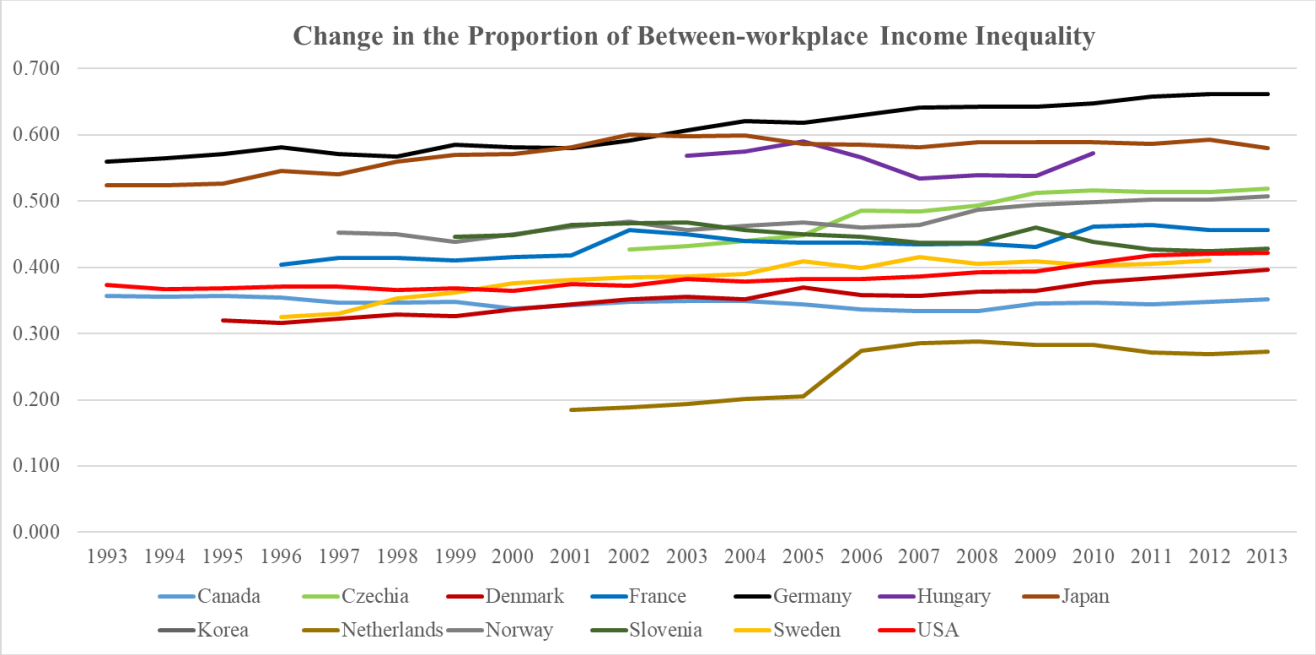

Figure 1: Trends in the proportion of income inequality that occurs between workplaces.

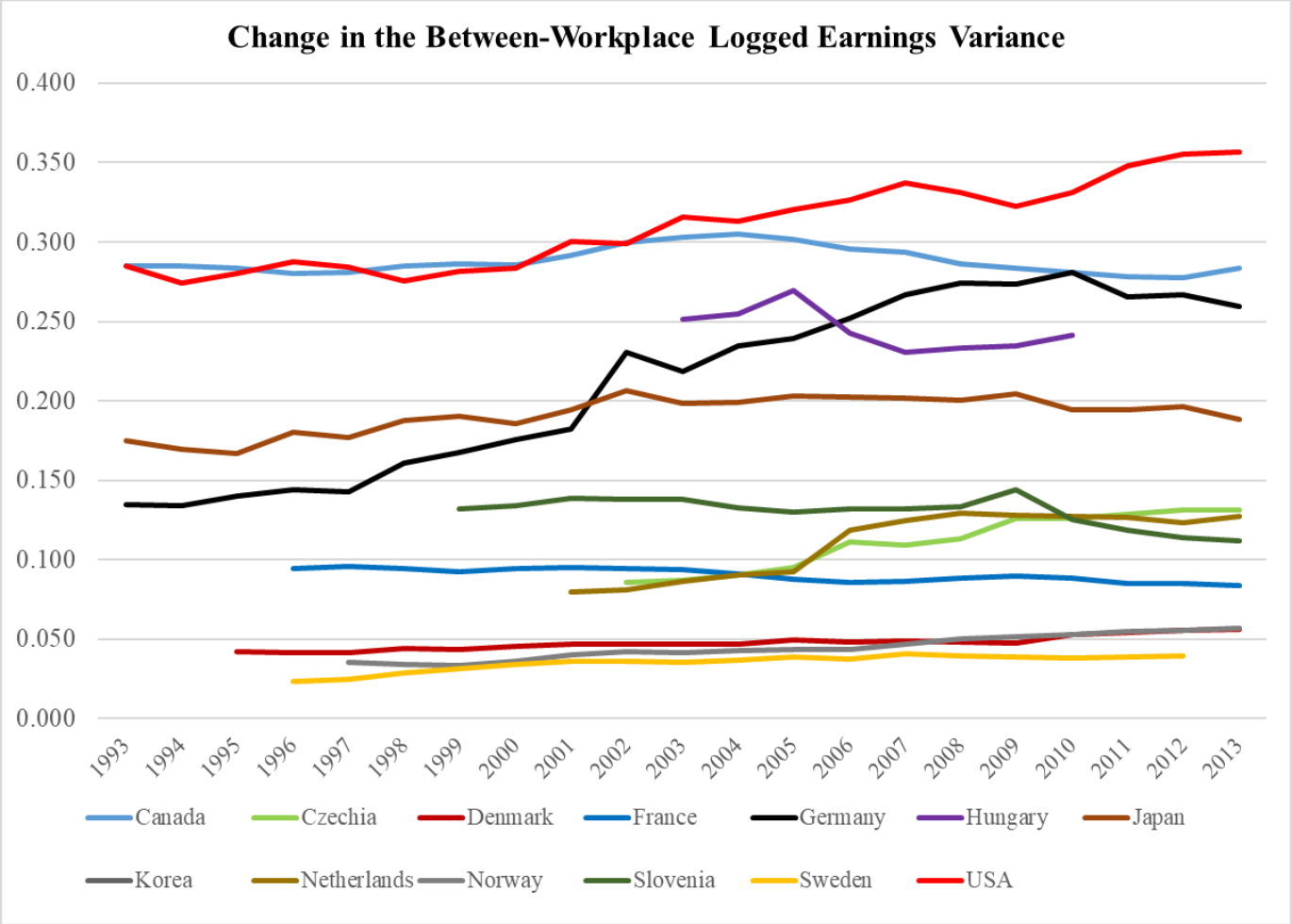

Figure 2: Trends in the between-workplace variance in logged income earnings.

Literature Review

Rising Between-Workplace Inequality

Between-workplace inequality occurs when the average income of workers differs across workplaces. Between-workplace inequality can emerge in a variety of ways. To name a few, when firms spin-off certain functions to contractors this results in workplaces which are more skill and occupation-homogenous within workplaces but more heterogenous between workplaces. This in turn can raise between-workplace inequality. In some instances, between-workplace inequality may be generated by a few powerful firms reaping the benefits of winner-

take-all market dynamics. In still other cases, uneven institutional power across different sectors can generate between-workplace inequality when workers in some sectors fall under the protection of strong unions and legal regulations and workers in other sectors do not. In each case, the end result is that the wages workplaces pay their workers are pulled further apart. Previous research has shown that countries strongly vary in their levels of between-workplace income inequality, both in terms of how much between-workplace inequality there is and also how much of total inequality is between-workplaces. For example, Figure 1 shows levels and trends of between-workplace inequality in terms the *variance of logged earnings*. Figure 2 displays the *proportion* of total inequality which occurs between workplaces. One can think of these as the *earnings* variance and proportion method of measuring between-workplace inequality, respectively. These two methods are obviously related to one another, but nonetheless the distinction carries with it important theoretical and practical considerations. Countries which have very high levels of one type of inequality may not rank as highly as others. The United States, a very unequal country overall, has high levels of between-workplace inequality in terms of logged earnings variance, but middling levels in terms of proportion of total inequality (about 44% of income inequality occurs between workplaces in the year 2013). Norway, on the other hand, has low levels of between-workplace inequality in terms of logged earnings variance, but over half of all income inequality occurs between workplaces. A rise in between-workplace proportion can stem from several sources. One is a rise in between-workplace earnings variance accompanied by either flat or falling within-workplace earnings variance. Another is flat between-workplace earnings variance accompanied by declining within-workplace earnings variance.

I raise the distinction between the earnings variance and proportion methods because they speak to different ways of understanding how income inequality flows through a country. Most countries in this study have seen rises in between-workplace earnings variance, and in most cases rising between-workplace earnings variance also comprises the bulk of total rising earnings inequality. At the same time, some countries are still dominated by within-workplace inequality dynamics. For researchers and policymakers who are interested in addressing problems related to income inequality, the distinction between between-workplace earnings variance and proportion is an important one. A comparison of the United States and the Netherlands is informative here. In the United States inequality is still dominated by within-workplace processes, which might mean that policy initiatives targeted at reducing within-workplace income inequality would be more attractive. At the same time, and because the US is such an unequal country to begin with, between-workplace earnings variance is quite high by any metric, and so those policies which target between-workplace inequality are also highly important. Like the United States, rising between-workplace earnings variance is responsible for the bulk of rising Dutch income inequality. In the Dutch case, however, between-workplace earnings variance is overall quite small (8-12 logged points to the US' 30-35 logged points), and the bulk of inequality occurs within-workplaces (in proportional terms, 81.5% to 72.7% of Dutch earnings inequality is within-workplace). Even though rising Dutch inequality over the last few decades has been primarily a between-workplace phenomenon, policymakers and researchers interested in reducing inequality would probably have much greater success in the Dutch case by focusing on those processes which reduce within-workplace income inequalities. Both between-workplace inequality in terms of proportions and earnings variance are important to study, but I am interested mainly in this paper with effects to *proportions* of between-workplace inequality.

However, I use models of between and within-workplace earnings variance to help explain how the institutional factors I am interested in impact the between and within components that produce the proportion of between-workplace income inequality.

Research on between-workplace inequality is still in its infancy. Nonetheless, we do know some things about it from prior studies located in both economics and sociology. First, between-workplace income inequality has been rising across most advanced, market economies since at least the early 1990s. It has generally risen faster in the private sectors of these economies, but there is evidence that public sectors in many countries have also experienced this rise (Tomaskovic-Devey et al. 2020). Although this growth seems to be fairly ubiquitous across countries, it is not universal. Within-workplace inequality seems to be the driving force of rising inequality in the UK, for example, at least among large firms (Schaefer and Singleton 2019). Growths in between-workplace earnings variance range from as little as 1.4 log points in earnings variance (in Denmark and Japan) to as high as 12.5 log points (Germany). Proportionally, growth in between-workplace inequality ranges from as little as .004 (Hungary) to as high as .103 (Germany), with only a single country, Slovenia, experiencing a decline. Countries likewise strongly differ in their levels of between-workplace income inequality. In the sample used in this paper, between-workplace earnings variance ranges from 2.4 (in Sweden) to 35.7 logged points (in the USA), and the between-workplace proportion of income inequality can range from 0.185 (the Netherlands) to 0.662 (Germany).

Employment Institutions, Labor Union Dynamics, and Economic Structure

The literature on rising income inequality has focused on a variety of mechanisms. Broadly, these mechanisms have tended to focus on 1) macroeconomic-related issues such as globalization, financialization, or the restructuring of firms, and 2) issues related to labor market

institutions such as declining union density or the decentralization of wage-setting (Nolan et al. 2019). The literature on between-workplace inequality has largely followed suit. Concerning macroeconomic forces, scholars have proposed that increased sorting of high-skilled or high-productive workers into high-paying firms (and vice versa for lower-skilled/productive workers) (Card et al. 2013; Skans et al. 2009; Song et al. 2019) has led to a growth in between-workplace inequality. There are several purported causes for this increase in productivity-sorting, but a notable one concerns the increased importance of exports in a globalized world. Scholars (Helpman et al. 2010; Egger and Kreickemeier 2010) have noted that better-performing, higher-productivity firms are more likely to switch to or place more importance on exporting under trade globalization. Trade globalization in turn has also been linked to wage increases among exporting firms and wage decreases among non-export firms (especially for low-skilled workers).

The "fissuring" of workplaces (Weil 2014) observed in recent years also likely plays an important role. Workplace "fissuring" occurs when workplaces, in a bid to focus on their "core" productions, spin off peripheral tasks to contract firms. A manufacturing firm, for example, may outsource its cleaning staff. A likely result of this process is the move towards workplaces which are more homogenous in terms of occupation/job but increasingly divergent in terms of wages. Workplace fissuring is further likely to increase between-workplace income inequality given that occupations which are outsourced into these contract firms often experience significant wage penalties (Dube and Kaplan 2010).

Others have focused on how changes in labor market institutions have impacted between-workplace income inequality. Card et al. (2013), in an examination of German between-workplace inequality, found that rising between-workplace inequality was related to a decline in

collective bargaining. German workplaces, especially younger workplaces, were increasingly likely to opt out of the industry-wide wage-setting agreements that characterize the German political economy, and these same workplaces also tended to pay lower wages. Skans et al. (2009) placed some of Sweden's rising between-workplace inequality on the increased ability of workers to engage in individual wage negotiations as wage-setting became more decentralized. Simón (2010) similarly found that countries with more decentralized collective bargaining and other wage-setting mechanisms also had higher levels of between-workplace income inequality. Still, the literature on rising between-workplace inequality is still quite scarce, so much work remains to be done in order to understand the factors that can influence rising between-workplace inequality. In this paper, I aim to test a variety of mechanisms sequestered into three broad areas: Employment Institutions; Labor Union Dynamics; and Economic Structure. Employment Institutions refer to structural aspects of the economy that are fairly broad in scope that concern regulations and norms regarding labor markets. Some examples of such institutions might include national minimum wage laws or legal regulations concerning work contracts. It is often the case that such institutions remain quite stable over time. Employment legislation (EPL) concerning regular working contracts for example, has barely changed at all in the past few decades among the set of countries examined here. As such, most Employment Institutions are not suited for the type of change analysis I use in this paper, but there are some exceptions (and stable variables may also provide some use as control variables as well). The chief independent variables related to Employment Institutions that I test in this paper are the levels at which wage bargaining occurs in the economy and discrepancies between EPL for regular contracts and temporary contract employees.

In many countries the levels at which wage-bargaining occurs (e.g. national, industry, workplace-level, etc.) have been gradually shifting over time. Some countries have moved from fairly strict industry-wide wage bargaining towards a mix of industry and workplace-level bargaining owing both to an increase in the workplaces that opt out of industry-level bargaining contracts and a rise in contracts which leave increased room for individualized wage bargaining. Levels of wage-setting have been consistently associated with levels of income inequality throughout the literature (Wallerstein 1999; Blau and Kahn 1999). Specifically, wage-setting decentralization, moving from higher-order levels such as national or industry wage-setting down to the workplace level, has generally been associated with an increase in income inequality (Alderson and Nielsen 2002; Kristal and Cohen 2007). Much of this literature has focused only on total, national levels of wage inequality (Rueda and Pontusson 2000), but as linked-employer-employee (LEE) data has become increasingly available researchers have begun to explore the impact of wage-setting centralization on between-workplace inequality as well. Símon (2008), using LEE data from the 2002 European Earnings Structures Survey, found in a cross-section of European countries that greater levels of wage-setting centralization was negatively associated with wage differential between firms. Wilmers (2019) similarly found that centralization among US manufacturing firms in the 1960s likewise reduced income inequality between workplaces. These findings make a certain amount of intuitive sense. Centralized wage-setting above the workplace level should constrain the ability of individual firms to either pay workers above the agreed-upon rate (although in practice there is always some wage drift) or to try and cut labor costs by paying lower wages. I follow the findings from previous literature (Simón 2010; Wilmers 2018) in hypothesizing that shifts towards lower levels of bargaining coordination (e.g.

from industry down to workplace-level bargaining) will be associated with rising between-workplace inequality.

Hypothesis 1: Decreasing levels of wage bargaining coordination will be associated with increasing levels of between-workplace inequality.

While regular contract EPL has mostly remained the same across OECD countries, temporary contract legislation has seen more movement. Many European countries reduced their temporary contract EPL amidst employer demands for increased labor market flexibility in the late 1990s and early 2000s. Other countries, such as France or South Korea, have actually increased their temporary contract EPL because of concerns about the large number of temporary workers in these economies (Shin 2013).

It is reasonable to assume that reductions in temporary contract EPL could be associated with rising between-workplace inequality because temporary workers are highly unlikely to be spread evenly across the economy. In most countries, workers with temporary contracts tend to be concentrated in industries like hotels, catering, or food processing (Gebel and Giesecke 2011; McKay et al. 2012). Industries such as these are often marked by poor union density and an overall weak labor movement presence. Deregulation of temporary contracts and the subsequent greater use of employers of temp workers has also been shown to be quite damaging to institutions that tend to protect workers (e.g. unions) (Doellgast and Greer 2007; Doellgast 2009). Thus, the deregulation of temporary contract EPL can open up the opportunity for employers in these areas to pay lower wages to these more vulnerable workers. Additionally, some preliminary evidence has shown that decreasing levels of temporary contract EPL were associated with rising levels of between-workplace inequality (Tomaskovic-Devey et al. 2020),

although in that study temporary contract EPL was only part of an overall scale measuring the strength of institutional protections for lower and mid-skilled workers.

Further, the actual levels of temporary EPL may not be as important as the gap between regular and temporary contract EPL. Labor market dualization (Emmenegger et al. 2012) in the political economic literature, for example, is marked by the combination of higher levels of regular contract EPL and lower levels of temporary contract EPL, leading to the existence of dual labor markets (one more protected and regulated, the other unregulated and vulnerable). Such phenomena has not been found, for example, in liberal market economies like the US or Canada, where both temporary and regular contract protections tend to be very low. It is reasonable to suspect that labor market dualization would be associated with higher between-workplace inequality. Germany, a standard example of a dualized economy, possesses a manufacturing sector full of well-paid workers on regular contracts existing alongside a weaker, poorly organized service sector full of low-wage workers. When countries possess such strong institutional differences across sectors, the wages paid in workplaces between sectors will also likely be quite large. In the second chapter of this dissertation for example, I showed that low-wage workers in Germany are overwhelmingly concentrated in service sectors like retail and very scarce in manufacturing. This kind of setup can clearly lead to high between-workplace inequality.

> Hypothesis 2: Rising levels of labor market dualization will be associated with rising between-workplace inequality.

Labor Union Dynamics concern factors related to labor unions and confederations. Scholars have mainly examined union density and collective bargaining coverage when studying issues of income inequality. Concerning total levels of income inequality, falling union density and

bargaining coverage have generally been associated with rising levels of inequality (Rueda and Pontusson 2000; Huber and Stephens 2014; Asher and DeFina 1997; Gustafsson and Johansson 1999; Gautie and Schmitt 2010; Bosch 2015). The picture for between-workplace inequality is not so different. Card et al. (2013), for example, linked Germany's rising between-workplace inequality to falling union and bargaining coverage rates. Tomaskovic-Devey et al. (2020) likewise found that decreasing bargaining coverage was associated with rising between-workplace inequality in a study of fourteen high-income countries. I follow this prior research by testing the hypotheses below, but then extend it below by investing further aspects of labor union beyond union density and bargaining coverage.

> Hypothesis 3: Decreasing levels of collective bargaining coverage will be associated with rising between-workplace inequality.
>
> Hypothesis 4: Decreasing levels of union density will be associated with rising between-workplace inequality.

A key insight from the previous chapter in my dissertation was that other aspects of labor unions outside of density and coverage had clear implications for between-workplace inequality. In that chapter other characteristics of labor movements, including union and confederation membership concentration, the extent of the authority that union and confederation leaders have over their members, and conflicts between unions all factored into cross-sectional level national variation in between-workplace inequality. Research on how these labor movement characteristics influence income inequality has been quite scant.

At least one study (Dolton and Robson 1996) found that lower levels of wage inequality was associated with higher levels of union membership concentration. The association makes some theoretical sense. Higher levels of membership concentration means that union leaders must take

a wide variety of workers' interests into account when negotiating bargaining contracts, which could result in more equitable wages (Ebbinghaus 2004). This would create an association between membership concentration and income inequality broadly, but its association with between-workplace inequality is more unclear.

Because of the overall lack of research on the relationship between these various labor movement characteristics and between-workplace inequality, I test the following hypotheses but remain essentially agnostic towards these relationships. I test these hypotheses both concerning unions and the wider confederations in which multiple unions are part of. Countries can strongly differ in whether individual unions or confederations are the real movers-and-shakers in the labor movement. In Germany for example, confederations (e.g. the DGB) do not possess much real control over their union members, and it is unions (e.g. IG Metall, ver.di) who hold the bulk of the bargaining power. In contrast, in many Scandinavian countries large confederations (e.g. Sweden's LO) lead wage-bargaining rounds and have much authority over the individual unions belonging to the confederation. Therefore, I also test "Labor" variables concerning membership concentrations and authority. "Labor" variables draw from union and confederation information from each country depending on whether unions or confederations are judged to be the lead actors (more information can be found in the Data section).

> Hypothesis 5: Decreasing levels of union/confederation/Labor membership concentration will be associated with rising levels of between-workplace inequality.
>
> Hypothesis 6: Decreasing levels of union/confederation/Labor authority over its members will be associated with rising levels of between-workplace inequality.

As mentioned above, various economic trends have been implicated in rising income inequality, and it is reasonable to think that some of these trends may likewise impact between-workplace

inequality as well. Financialization, for example, has been directly associated with rising income inequality (Lin and Tomaskovic-Devey 2013) and with the weakening of important inequality protective institutions such as union density (Meyer 2019; Kollmeyer and Peters 2019). The pressure that financialization can put on employers to maximize short-term profits and labor flexibility could increase between-workplace inequality to the extent that it encourages the polarization of firms into "high-road" and "low-road" management strategies. One way in which this might occur is through workplace "fissuring," in which workplaces eliminate some departments and outsource the tasks to a contract firm (e.g. hiring janitorial services through a contracting agency instead of directly employing janitors (Weil 2014). Workplace "fissuring" can exacerbate between-workplace inequality by reducing within workplace occupational heterogeneity, leading to workplaces composed mostly of high-earning occupations or lower-earning occupations. Additionally, occupations which have been outsourced often receive reduced wages afterwards (Goldschmidt and Schmeider 2017; Dube and Kaplan 2010). As such, I test the following hypothesis.

> Hypothesis 7: Increasing levels of domestic financialization will be associated with rising levels of between-workplace inequality.

Globalization has been associated with rising income inequality in much of the political economic literature (Alderson and Nielsen 2002). Much like financialization, globalization might also play an indirect role in increasing income inequality through the effect it has on inequality-reducing institutions like rates of collective bargaining, union density, or the size of the manufacturing sector. Globalization may place more burden on union organizing for already vulnerable sectors, as employers can more easily threaten to outsource certain tasks or jobs. At least one article has found that higher levels of globalization are associated with declines in

employment in the manufacturing sector (Kollmeyer 2009), a sector which is still the source of much of the union strength in many advanced, industrialized nations.

Although there are thus far no studies linking globalization to rising between-workplace inequality, there are some reasons to think it may play a role. Increasing globalization has been shown to increase wage premiums for export-oriented organizations (Klein et al. 2010), and some scholars have hypothesized that increasing globalization will also lead more productive workplaces to move towards an export-oriented model, leading workers in these firms to benefit from wage increases. Workers who are employed in non-exporting firms of course would not benefit from these wage increases or premiums. In this manner, trade globalization might factor into rising between-workplace inequality as some workplaces (export-oriented) receive wage premiums in a globalized economy and others do not or even face downward wage pressures. I test the following hypothesis related to trade globalization.

> Hypothesis 8: Increasing levels of trade globalization will be associated with rising levels of between-workplace inequality.

Finally, I am also interested in how the size of the manufacturing and service sectors are related to between-workplace inequality. Manufacturing sectors in many countries are still the backbone of the union movement, featuring higher rates of union membership, wider scopes for bargaining contracts, and an overall more organized institutional layout. In contrast, service sectors tend (but are not always) to be marked by lower rates of union memberships, weaker bargaining contracts which employers can often simply opt out of, and an overall fractured, disorganized labor context. Because manufacturing sectors tend to have higher levels of unionization and often engage in industry-wide bargaining with relatively limited derogation (individual workplaces opting out of a wider contract), I expect that larger manufacturing sectors will be associated with

lower between-workplace inequality. Because service sectors tend to be marked by low union density and labor power and tend to be much more unregulated and disorganized from an institutional perspective, I expect that larger service sector size will be associated with higher between-workplace inequality. It is worth noting however that manufacturing firms, at least in advanced, industrialized countries, have been able to offshore or outsource lower-skilled manufacturing tasks, which could lead to overall more skill and job-homogenous manufacturing firms (service sector firms tend to much more constrained in the types of jobs they can outsource). Such trends theoretically just as likely to impact within-workplace income inequality as they would between-workplace inequality.

Hypothesis 9: Increasing manufacturing sector size will be associated with decreasing between-workplace inequality.

Hypothesis 10: Increasing service sector size will be associated with increasing between-workplace inequality.

Data and Measurement

This chapter shares sources of data with the previous chapter. Data on between-workplace inequality stems from the data collected by the wider COIN project. Income data from thirteen high-income countries across North America, Europe, and East Asia were collected for roughly the years 1993-2013. Earnings data were transformed to as close to hourly earnings as the data made possible (more information on each country's data can be found in Appendix X), and then log transformed. I then follow Lazear and Shaw (2009) and Tomaskovic-Devey et al. (2020) in the measurement of between-workplace inequality. I decompose the logged earnings variance into within-workplace and between-workplace inequality with the following formula:

$$\sigma^2 = \sum_{j=1}^{J} p_j \, \sigma_j^2 + \sum_{j=1}^{J} p_j \, (\overline{w}_j - \overline{\overline{w}}_.)^2 \, ,$$

where p_j is the share of workers in the economy who are working in firm j, σ_j^2 is the variance of wages in firm j, $\bar{w}_j$ is the mean wage for firm j (across its workers), and $\bar{\bar{w}}_.$ is the mean wage for the entire economy across its workers and firms (Lazear and Shaw 2009; pp. 7-8). I then use the national proportion of inequality that is between workplaces as my main dependent variable. I also use measures of between-workplace income variance and within-workplace income variance to further understand shifts in the between-workplace proportion of income inequality. In Figure 1 below, the proportions of between-workplace inequality for each of the thirteen countries in the project is shown. Although results exist for total, private-sector only, and public-sector only samples, I will only use estimates from the total sample, except in countries where private-sector only estimates are the only ones available (Japan and South Korea).

The institutional information used in this chapter is largely collected from Jelle Visser's ICTWSS dataset (Visser 2019), which provides the most accurate information available on collective bargaining coverage, measures of wage centralization, union and confederation consolidation, minimum wage laws, and so on. I supplement this source with measures of legal employment protection (EPL) for regular and temporary contracts from the OECD's database. Additionally, measures of financialization and globalization are collected from the KOF Globalization index (Gygli et al. 2019).

Institutional Variables

Level of Wage Bargaining: This item measures the actual level at which collective bargaining agreements take place. Effectively, this variable takes into account the predominant level of wage bargaining (e.g. industry-level) and various exceptions, derogations, or other ways workplaces can opt-out or opt-in to higher bargaining levels. It is quite important to take into account sources of below-industry/national level bargaining in the time period analyzed as many

European countries have begun to shift from industry-level bargaining to various degrees of mixed workplace/industry bargaining. The item is measured on a scale of 1-7, where "1" would equal fully workplace-level bargaining only and "7" would equal fully national-level bargaining.

EPL Dualization: Following Emmenegger et al. (2012), I conceptualized dualization here as a political process in which "policies increasingly differentiate rights, entitlements, and services provided to different categories of recipients" (Emmenegger et al., pg. 10). Labor market dualization can occur in a variety of ways, but in this chapter I operationalize dualization as the discrepancy between EPL regarding regular and temporary contracts (Regular EPL minus Temporary EPL). This measurement was chosen because the deregulation temporary contracts was a significant factor in institutional changes across Europe in the time period analyzed, with many countries slashing regulations around temporary contracts (so-called "flexibility at the margins" Barbieri and Cutuli 2016) to acquiesce to employer demands for greater labor market flexibility.

Union Density: This item is measured as the proportion of all workers who are union members.

Collective Bargaining Coverage: This item is measured as the proportion of all workers with the right to bargaining who are covered by a collectively bargained contract.

Union/Confederation/Labor Concentration: These variables were measured at both the union and the confederation level. Membership concentration was calculated as a Herfindahl index. The Herfindahl (H_{CF}) index for union confederations ($H_{CF} = \Sigma_i^n(p_i^2)$) is given by the proportion of total membership organized by the I^{th} confederation where n is the total number of confederations. Effectively, it measures how concentrated or fractured union/confederation membership is. A score of 1 would mean that all union/confederation members belonged to a

single union/confederation. Note that membership concentration is irrespective of the size of the labor movement in a country.

Union/Confederation/Labor Authority: These variables are summary measures of centralized union/confederational authority, calculated from membership concentration (horizontal coordination of the union movement) and statutory power (vertical coordination of the union movement). Mathematically, this indicator is calculated by multiplying union concentration by the level of statutory power (e.g. ability of unions/confederations to veto bargaining, impose dues, appoint representatives, etc.) and then taking the square root of the product. By weighting both the horizontal and vertical coordination of the union movement in a country, this measure seeks to capture the level of centralized authority unions have over wage bargaining and other issues.

Conflict Between Unions: The ICTWSS contains a rough measurement of the presence of external conflict across unions. The item is measured 1-3, with "1" representing the absence of conflict and the presence of routine cooperation, "2" representing moderate levels of conflict that occasionally leads to separate bargaining, and "3" representing high levels of conflict between unions and competition over members and influence.

Domestic Financialization: My measure of domestic financialization is based on the volume of stocks traded as a percentage of GDP (STOCKS). This measure was chosen following Godechot (2016), who found that much of financialization's impact on inequality was driven by the "marketization" aspects of finance. This measure is closest to the fissuring account (Weil 2014; Lin and Tomaskovic-Devey 2013) in which larger firms outsource production while keeping control of brand-based earnings.

Global Financialization: I test an additional measure of global financialization. My measure of global financialization comes from the KOF measure of financial globalization. The KOF measure is based on levels of foreign direct investment, the capital flows and stocks of foreign assets, and the overall openness of a country to financial investments (Gygli et al. 2019).

Trade Globalization: I use the KOF measure of globalization (Gygli et al. 2019). The KOF measure of trade globalization measures exposure to and engagement in global trade. It is composed of items such as 1) the long-distance exchange of goods and services (e.g. import/exports as shares of GDP; 2) the heterogeneity of trade partners; and 3) policies that facilitate trade between countries, such as trade regulation, tariff rates, or free trade agreements.

Manufacturing/Service Sector Size: Manufacturing and service sector size are measured as the percentage of all workers who are in the manufacturing/service sector.

Methodology

I use error correction models (De Boef and Keefe 2008; Tomaskovic-Devey, Lin, and Meyers et al. 2015; Tomaskovic-Devey et al. 2020) to investigate the relationship between between-workplace inequality and labor market institutions. Single-equation error correction models take the following form:

$$\Delta Y_t = a_0 + a_C + a_1 Y_{t-1} + \beta_0 \Delta X_{t-(t-1)} + \beta_1 X_{t-1} + E_t$$

In the first stage of the model, the the short-term coefficient and standard error of ΔX can be estimated. Afterwards, the long-term effect of ΔX can be calculated as $\beta_1 X_{t-1}$, divided by the error correction rate ($\alpha_1 Y_{t-1}$). The Bewley transformation can then be used to estimate the standard error of the long-term effect of X. Error correction models have all the standard benefits of the regression framework (controlling for variables, effect sizes, r-squared values, etc.). The clear added benefit of error correction models for this chapter is that they allow one to identify

both immediate and over-time effects of variables. This is particularly useful here because theoretically most of the effects of institutional change should not happen instantaneously but gradually over time. Institutional change is a slow process even when the change is dramatic. As such, I am mainly interested in the results of the long term effect estimates and less so for the models regarding immediate effects. Additionally, I apply a fixed-effect at the country level to control for any time-invariant aspects of countries. Thus, the models in this paper model only within-country variance.

I first estimate a series of models for each of the main independent variables, controlling for yearly unemployment and labor force participation rates. Following insights gained from the previous chapter of the dissertation, I then concentrate on the series of items related to unions and labor movements. First, I test for main effects for each item while controlling for a set of institutional and economic factors. Then, I test a series of interaction effects involving union dynamics as well.

Results

Main Effects

Table 1 below show the short-term and long-term coefficients and standard errors for the main effect models. Although I show both short-term and long-term coefficients, I am mainly interested in the long-term effects, which are more consistent with how scholars think of institutional change, which happens gradually over time.

Table 1: Error Correction Models for the Proportion of Between-workplace Inequality

	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
▲ Level of Wage-setting	0	-0.004	0.002	-0.004	0	-0.002	0.010***	-0.002	0.002	-0.001	0.007***	-0.001
Lagged Level of Wage-setting	0	-0.007	0.001	-0.007	0	-0.003	0.009***	-0.003	0.003	-0.003	0.015***	-0.002
▲ Union Density	0.001***	0	0.008***	0	0.001***	0	0.011***	0	0	0	0	0
Lagged Union Density	0	0	-0.002***	0	0	0	-0.004***	0	0	0	-0.001***	0
▲ Bargaining Coverage	-0.001	-0.001	-0.004***	-0.001	0	0	-0.007***	0	0	0	0.001***	0
Lagged Bargaining Coverage	0	0	-0.002***	0	0	0	-0.001***	0	0	0	0.001***	0
▲ Conc. Confederation	-0.028**	-0.011	-0.196***	-0.012	-0.013**	-0.005	-0.195***	-0.006	-0.007	-0.014	-0.034**	-0.014
Lagged Conc. Confederation	-0.026**	-0.012	-0.185***	-0.011	-0.007	-0.005	-0.107***	-0.004	-0.002	-0.011	-0.008	-0.01
▲ Conc. Union	0.133*	-0.074	0.811***	-0.088	0.315*	-0.165	4.737***	-0.102	0.151	-0.136	0.737***	-0.131
Lagged Conc. Union	0.143***	-0.016	0.869***	-0.026	0.062	-0.037	0.937***	-0.026	0.012	-0.025	0.060**	-0.024
▲ Conc. Labor	0.005	-0.031	0.036	-0.03	0.009	-0.052	0.153***	-0.048	0.005	-0.023	0.026	-0.023
Lagged Conc. Labor	0.067	-0.043	0.512***	-0.039	0.031	-0.041	0.505***	-0.028	0.008	-0.017	0.043**	-0.016
▲ Cent. Confederation	-0.146***	-0.02	-1.233***	-0.042	-0.079***	-0.014	-2.048***	-0.028	-0.029***	-0.007	-0.147***	-0.008
Lagged Cent. Confederation	-0.102***	-0.032	-0.858***	-0.02	-0.02	-0.019	-0.525***	-0.019	-0.004	-0.01	-0.020*	-0.01
▲ Cent. Union	0.129**	-0.053	0.797***	-0.065	0.213	-0.134	2.552***	-0.059	0.071	-0.102	0.350***	-0.098
Lagged Cent. Union	0.106***	-0.015	0.656***	-0.021	0.055	-0.038	0.659***	-0.021	0.003	-0.022	0.014	-0.022
▲ Cent. Labor	0.021	-0.056	0.134**	-0.056	0.054	-0.106	0.597***	-0.089	0.012	-0.053	0.063	-0.053
Lagged Cent. Labor	0.089***	-0.019	0.586***	-0.021	0.053	-0.044	0.591***	-0.023	0.002	-0.02	0.012	-0.02
▲ Dualization	-0.004	-0.002	-0.029***	-0.002	-0.001	-0.001	-0.015***	-0.001	0.002*	-0.001	0.011***	-0.001
Lagged Dualization	0.001	-0.003	0.010**	-0.003	0.005	-0.003	0.057***	-0.002	0.003**	-0.001	0.017***	-0.001
▲ Manufacturing Size	-0.003**	-0.001	-0.013***	-0.001	-0.001	-0.001	-0.009***	-0.001	0.001	-0.001	0.005***	-0.001
Lagged Manufacturing Size	-0.001	-0.001	-0.006***	0	0	0	-0.006***	0	0	0	-0.002***	0
▲ Service Size	0.002	-0.001	0.009***	-0.001	0	-0.001	0.007***	-0.001	-0.001	-0.001	-0.004***	-0.001
Lagged Service Size	0.001*	0	0.004***	0	0	0	0.004***	0	0	0	0.001***	0
▲ Domestic Financialization	0	0	0.000**	0	0	0	0.000***	0	0	0	0	0
Lagged Domestic Financialization	0.000**	0	0.000***	0	0.000***	0	0.001***	0	0	0	0.000***	0
▲ Trade Globalization	0	0	0.002***	0	0	0	0.002***	0	0	0	0.001***	0
Lagged Trade Globalization	0	0	0.002***	0	0.000**	0	0.004***	0	0.000**	0	0.001***	0
▲ Financial Globalization	0	-0.001	0	-0.001	0	0	0.001*	0	0.000**	0	0.002***	0
Lagged Financial Globalization	0	0	0.002***	0	0.000***	0	0.005***	0	0.000***	0	0.002***	0

Note: Each model consisted of one independent variable (e.g. union density) and two control variables, unemployment and labor force participation rates. In the Short-term column, the ▲ variables contain the relevant coefficients. In the Long-term column, the Lagged variables contain the relevant coefficients. Number of observations for the Long-term models range from 196 to 171 observations. R-squared results for the Long-term models range from .772 to .856.

Hypothesis 1 postulated that decreasing levels of wage coordination would be associated with rising levels of between-workplace inequality. I was unable to confirm Hypothesis 1, as the level of wage-setting was not significantly associated with the proportion of between-workplace inequality. Interestingly, this seems to be the case because levels of wage-setting impacts both between and within-workplace income variance. The association between level of wage-setting and both between and within-workplace variance are significant and positive. Whereas previous literature often found that high levels of wage-setting were associated with lower levels of income inequality, the opposite seems to be the case here. This finding is somewhat unexpected. One possibility is that in the time period I am analyzing much of the movement in wage-setting

has been shifting between either workplace-level or industry-level bargaining, with cross-industry or fully national bargaining no longer making much of an appearance. The kind of medium levels of wage-setting (hovering around industry-level agreements) that characterize countries in this dataset may simply no longer serve the inequality-reducing functions they once might have. This is especially the case given that, increasingly, more vulnerable workers who once would have been included in these contracts (e.g. janitorial workers in manufacturing firms) are now left out (German cite).

In Hypothesis 2, I suggested that rising levels of labor market dualization (measured as the difference in strength between regular and temporary contract EPL) would be associated with rising between-workplace inequality. The results for the long-term effects in the error correction models were in line with hypothesis 3. A one unit increase in EPL dualization was significantly associated ($p < .01$) with a .01 decrease in the proportion of between-workplace inequality. Results from the models for between and within-workplace variance show that EPL dualization exacerbates both types of income inequality but has a stronger effect for between-workplace income inequality.

Hypotheses 3 and 4 concerned union density and collective bargaining coverage, respectively. In both cases, I postulated that declining levels of union density and bargaining coverage would be associated with rising between-workplace inequality. I was able to confirm both hypotheses as increases in union density and bargaining coverage were both significantly associated with declining between-workplace inequality.

A one unit increase in union density or bargaining coverage was associated with a .002 decline in between-workplace inequality ($p < .001$). Given that in this dataset it was not uncommon for countries to see union or bargaining coverage declines of 5, 10, or more points, the long-term

impact of declining union density and bargaining coverage on between-workplace inequality could be quite substantial. Further, models of between and within-workplace variance show that declining union density exacerbates both types of income inequality but has a stronger effect on between-workplace inequality, suggesting that inequality between unionized and non-unionized workplaces are the chief way in which union density impacts inequality here.

Collective bargaining coverage, in contrast has more mixed results. Like union density, declining bargaining coverage is associated with rising between-workplace income variance and proportion of total inequality, but declining within-workplace income variance. The reason for these discrepant effects is not clear.

Whereas hypotheses 3 and 4 were concerned more with the size of the labor movements in countries, hypotheses 5 and 6 considered the shape and character of labor movements by focusing on the concentration of members across unions and confederations and the level of authority union and confederation leaders have over their members. I tested these hypotheses at both the union and confederation level. It is important to test both for the following reason. Union and confederation dynamics can have quite different consequences for between-workplace inequality.

Confederations are by definition composed of multiple unions across a wider sector of the economy, whereas unions often (but not always) are more narrowly associated with particular occupations or industries. As such, it is reasonable to assume that dynamics around confederations might have stronger or totally different impacts on between-workplace inequality than unions.

Because not much research has been done on how union/confederation concentration and authority are related to income inequality, let alone between-workplace income inequality,

hypotheses 5 and 6 are fairly exploratory in nature. I hypothesized that both decreasing levels of union/confederation membership concentration and authority would be associated with rising between-workplace inequality.

I was able to confirm hypothesis 5 for confederation but not for unions. A one unit increase in confederation membership concentration was associated with a .185 decrease in between-workplace inequality ($p < .001$), whereas a one unit increase in union membership concentration was associated with a .869 increase in between-workplace inequality ($p < .001$). Similar results are found regarding the centralization of union /confederation of union authority. Models concerning between and within-workplace variance reveal that confederational membership concentrated was negatively associated with between-workplace variance but had no impact on within-workplace inequality. Rising union membership concentration on the other hand significantly increased both between and within-workplace income variance, but the impact on between-workplace variance was far greater.

Hypothesis 6 could again only be confirmed for confederations. A one unit increase in the centralization of confederational authority was associated with a -.858 decrease in between-workplace inequality ($p < .001$), whereas a one unit increase in the centralization of union authority was associated with a .656 increase in between-workplace inequality.

Rising centralization of confederational concentration was also negatively associated with within-workplace income variance, but the effect on between-workplace variance was much greater. In contrast, rising centralization of union authority was significantly and positively associated with between-workplace income variance but had no effect on within-workplace income variance.

Hypotheses 7-10 concerned various aspects of economic structure. Levels of trade globalization, domestic financialization, and the size of manufacturing and service sectors were all examined. Hypotheses 7 suggested that rising levels of domestic financialization would be associated with rising between-workplace inequality. Hypothesis 8 suggested that rising levels of trade globalization would also be associated with rising between-workplace inequality. I was able to confirm both of these hypotheses, as a one unit increase in trade globalization was found to be significantly associated with a .002 increase in between-workplace inequality ($p < .001$), and a one unit increase in domestic financialization was significantly associated with a .000 increase in between-workplace inequality ($p < .001$). Additionally, both rising trade and financial globalization were significantly associated with rising within-workplace income variance, but the effect on between-workplace variance income was larger.

Hypotheses 9-10 predicted opposite effects for the manufacturing and service sectors. Hypothesis 9 suggested that an increase in the size of the manufacturing sector would be associated with a decline in between-workplace inequality, whereas Hypothesis 10 suggested that an increase in the service sector would be associated with an *increase* in between-workplace inequality. Both hypotheses were again confirmed; a one unit increase in the size of the manufacturing sector was significantly associated with a -.006 decrease in between-workplace inequality ($p < .001$), and a one unit increase in the size of the service sector was significantly associated with a .004 increase in between-workplace inequality ($p < .001$). Manufacturing and the service sector were both additionally associated with both between and within-workplace income variance, in both cases the impact on between-workplace income variance was greater.

Interaction Effects

I also ran a series of interaction effects on various aspects of union and confederation dynamics. Because of the dearth of prior research concerning many of these items on income inequality, I consider these to be largely exploratory models. However, a key insight of the previous chapter was that in cross-section institutions often act together in myriad ways that impact between-workplace inequality, particularly those involving labor union dynamics and employment institutions. As such, it is important to further explore how interactions might impact between-workplace inequality in a longitudinal context. Tables 2 and 3 below show interactions between collective bargaining coverage and union density and a range of items involving labor unions and employment institutions which vary over time.

Table 2: Interaction Effects with Collective Bargaining Coverage Density												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
▲Centralized Confederational Authority - Econ. Controls	-0.034***	-0.01	-0.667***	-0.055	-0.015***	-0.004	-0.310***	-0.02	0.012	-0.008	0.046***	-0.006
Lagged Centralized Confederational Authority - Econ. Controls	0.001	-0.002	0.024***	-0.001	0	-0.002	0.009***	-0.001	0.001	-0.002	0.005**	-0.002
▲Centralized Confederational Authority - Inst. Controls	-0.038***	-0.011	-0.731***	-0.043	-0.011**	-0.005	-0.149***	-0.013	0.017**	-0.007	0.074***	-0.004
Lagged Centralized Confederational Authority - Inst. Controls	0	-0.002	0.003	-0.002	0.001	-0.002	0.013***	-0.001	0.002	-0.001	0.007***	-0.001
▲Confederational Membership Concentration - Econ. Controls	-0.014***	-0.003	-0.182***	-0.013	-0.005***	-0.001	-0.110***	-0.004	0.004**	-0.001	0.017***	-0.002
Lagged Confederational Membership Concentration - Econ. Controls	0	0	-0.007***	-0.001	0	0	-0.002***	0	0	0	0.001**	0
▲Confederational Membership Concentration - Inst. Controls	-0.016***	-0.003	-0.240***	-0.013	-0.006***	-0.001	-0.062***	-0.002	0.006***	-0.002	0.026***	-0.002
Lagged Confederational Membership Concentration - Inst. Controls	0	0	-0.003***	0	0	0	0.002***	0	0	0	0.002***	0
▲EPL Dualization - Econ. Controls	-0.004	-0.003	-0.024***	-0.004	-0.002	-0.001	-0.019***	-0.002	0.002	-0.002	0.006***	-0.002
Lagged EPL Dualization - Econ. Controls	0	0	0.000**	0	0	0	0.001***	0	0	0	0.000***	0
▲Domestic Financialization - Inst. Controls	-0.000***	0	-0.000***	0	-0.000**	0	-0.000***	0	0.000***	0	0.000***	0
Lagged Domestic Financialization - Inst. Controls	0	0	-0.000***	0	0	0	0.000***	0	0	0	0.000***	0
▲Manufacturing - Inst. Controls	-0.001**	0	-0.007***	0	0	0	-0.004***	0	0	0	0.002***	0
Lagged Manufacturing - Inst. Controls	0	0	0.000***	0	0.000***	0	0.000***	0	0	0	-0.000***	0
▲Service - Inst. Controls	0	-0.001	0.001**	-0.001	0	0	-0.001*	0	0	0	0	0
Lagged Service - Inst. Controls	0	0	-0.000***	0	-0.000**	0	-0.000***	0	0	0	0.000***	0
▲Financial Globalization - Inst. Controls	0.000***	0	0.003***	0	0.000**	0	0.003***	0	0	0	-0.000***	0
Lagged Financial Globalization - Inst. Controls	0	0	-0.000***	0	0	0	0.000***	0	0	0	0.000***	0
▲Trade Globalization - Inst. Controls	0.001***	0	0.010***	-0.001	0.001***	0	0.005***	0	-0.001**	0	-0.003***	0
Lagged Trade Globalization - Inst. Controls	-0.000*	0	-0.000***	0	0	0	0	0	0.000*	0	0.000***	0

Note: Models with Econ. Controls had controls for manufacturing sector size, service sector size, trade globalization, financial globalization, unemployment rate, and labor force participation rate. Models with Inst. Controls had controls for the level of wage-bargaining, EPL Dualization, unemployment rate, and labor force participation rate. *** = p < .001, ** = p < .01, * = p < .05. Full models can be found in the Appendix (Models 4A-11).

Table 3: Interaction Effects with Union Density												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
▲Bargaining Coverage - Econ. Controls	-0.001*	0	-0.003***	0	-0.000**	0	-0.003***	0	0	0	0	0
Lagged Bargaining Coverage - Econ. Controls	0.000***	0	0.000***	0	0.000***	0	0.000***	0	-0.000*	0	-0.000***	0
▲Bargaining Coverage - Inst. Controls	0	0	-0.002***	0	-0.000*	0	-0.001***	0	0	0	0.001*	0
Lagged Bargaining Coverage - Inst. Controls	0.000***	0	0.000***	0	0.000***	0	0.000***	0	0	0	-0.000***	0
▲Centralized Union Authority - Econ. Controls	0.017	-0.118	0.1	-0.12	0.034	-0.048	0.228***	-0.042	-0.018	-0.064	-0.078	-0.063
Lagged Centralized Union Authority - Econ. Controls	-0.001	-0.001	-0.005***	-0.001	-0.002	-0.002	-0.015***	-0.001	0	-0.001	-0.002*	-0.001
▲Centralized Union Authority - Inst. Controls	0.001	-0.123	0.005	-0.123	0.026	-0.053	0.220***	-0.047	-0.022	-0.064	-0.101	-0.063
Lagged Centralized Union Authority - Inst. Controls	-0.001	-0.001	-0.009***	-0.001	-0.002	-0.001	-0.015***	-0.001	0	-0.001	0	-0.001
▲Union Membership Concentration - Econ. Controls	0.028	-0.135	0.156	-0.139	0.038	-0.04	0.393***	-0.042	-0.013	-0.068	-0.056	-0.067
Lagged Union Membership Concentration - Econ. Controls	-0.001	-0.001	-0.008***	-0.001	-0.001	-0.002	-0.013***	-0.001	0	-0.001	0.001	-0.001
▲Union Membership Concentration - Inst. Controls	0.015	-0.136	0.086	-0.137	0.046	-0.043	0.465***	-0.044	-0.003	-0.076	-0.012	-0.076
Lagged Union Membership Concentration - Inst. Controls	-0.002**	-0.001	-0.014***	-0.001	-0.002	-0.001	-0.016***	-0.001	0.001	-0.001	0.002**	-0.001
▲EPL Dualization - Econ. Controls	0	-0.001	-0.001	-0.001	-0.001	-0.001	-0.008***	-0.001	0	-0.001	-0.001*	-0.001
Lagged EPL Dualization - Econ. Controls	0	0	-0.001***	0	0	0	-0.001***	0	0	0	0.000***	0
▲Domestic Financialization - Inst. Controls	0	0	0.001***	0	0	0	-0.000**	0	0	0	0	0
Lagged Domestic Financialization - Inst. Controls	0	0	0.000***	0	0	0	0.000***	0	0	0	0	0
▲Manufacturing - Inst. Controls	-0.001	-0.001	-0.003***	-0.001	0	0	-0.005***	0	0	0	0.001***	0
Lagged Manufacturing - Inst. Controls	0	0	0	0	0	0	0.000***	0	0	0	0.000**	0
▲Service - Inst. Controls	0.001	-0.001	0.004***	0	0	0	0.004***	0	0	0	-0.000**	0
Lagged Service - Inst. Controls	0	0	0	0	0	0	-0.000***	0	0	0	-0.000***	0
▲Financial Globalization - Inst. Controls	-0.000**	0	-0.001***	0	-0.000*	0	-0.001***	0	0	0	0	0
Lagged Financial Globalization - Inst. Controls	0	0	-0.000***	0	0	0	-0.000**	0	0	0	-0.000***	0
▲Trade Globalization - Inst. Controls	0	0	0.003***	0	0.000**	0	0.004***	0	0.000***	0	0.001***	0
Lagged Trade Globalization - Inst. Controls	0	0	0.000***	0	0	0	0	0	0	0	-0.000***	0

Note: Models with Econ. Controls had controls for manufacturing sector size, service sector size, trade globalization, financial globalization, unemployment rate, and labor force participation rate. Models with Inst. Controls had controls for the level of wage-bargaining, EPL Dualization, unemployment rate, and labor force participation rate. *** = p < .001, ** = p < .01, * = p < .05. Full models can be found in the Appendix (Models 12A-18).

Hypothesis 8 proposed that a high level of union conflict would weaken the relationship between collective bargaining coverage/union density and between-workplace inequality. I was able to confirm this hypothesis, but bargaining coverage and union density have differing relationships

with conflict between unions. Results from Table 2 had previously shown that both bargaining coverage and union density had significantly negative long-term associations with between-workplace inequality. The interaction term for external conflicts between unions regarding collective bargaining was positive, suggesting that higher levels of conflict between unions weakens some of bargaining coverage's negative impact on between-workplace inequality. In contrast, the interaction term regarding union density and conflict between unions was actually negative, suggesting that higher levels of union conflict actually enhanced the between-workplace inequality-reducing aspects of union density. This last finding is quite surprising and requires further research to understand exactly why this would be the case.

Next, I examine the results of the interaction models involving collective bargaining density. Rising levels of membership concentration at the confederational level seem to significantly enhance collective bargaining coverage's ability to reduce between-workplace inequality ($p < .001$). The model for between-workplace variance was also significantly negative, whereas for within-workplace income variance the coefficient was significantly negative. The findings related to between-workplace inequality (both proportional and in terms of income variance) makes theoretical sense, as union confederations tend to be broad labor organizations composed of many types of occupations and professions across the economy (e.g. Germany's DGB or Sweden's LO). As confederations become more encompassing of a wider share of the labor force, their approach to wage-bargaining should also become more focused on striking deals that benefit a more heterogenous group of workers as well. In previous years for example, Nordic countries used to be characterized by these kinds of large, dominant confederations. However, many of these confederations have seen a lot of members spinning off into other confederations,

and organizations like the Swedish *Landsorganisationen i Sverige* (LO) are no longer the undisputed powerhouses they used to be.

I also examined the interaction of EPL dualization and contract coverage. A significant interaction effect was found, but it was very, very small (a coefficient of less than .001). Regarding labor union dynamics, centralization of confederational authority and membership concentration were also tested. Centralization of authority was somewhat unstable depending on the types of control variables added to the model, whereas results regarding membership concentration were quite stable.

I tested four items related to the economic structure of countries: financial globalization; trade globalization; manufacturing sector size; and service sector size. No significant interaction effects were found for manufacturing service sector size. Results from Table 2 showed that all three of the remaining items had significantly positive associations with rising between-workplace inequality. In contrast, the interaction with bargaining coverage for these three items were all significantly negative, suggesting that rising bargaining coverage could help mitigate the between-workplace inequality-generating effect of financial globalization, trade globalization, and service sector size. However, the coefficient in all three cases was quite small, suggesting a fairly limited interaction effect.

Interaction effects regarding union density were broadly consistent with collective bargaining coverage, but with a few exceptions. The first is that no significant interaction effects were found regarding union density and the size of the service sector (a consequence of the interaction term having similar effects on both between and within-workplace variance). Secondly, there was actually a significantly *positive* interaction effect regarding trade globalization. The main effect of rising trade globalization was significantly associated with rising between-workplace

inequality in Table 2, and the interaction term here seems to suggest that rising union density would further facilitate rising trade globalization's effect on the proportion of between-workplace inequality. This seems to occur because rising union density might mitigate rising trade globalization's positive impact on within-workplace income variance, but it does not affect between-workplace income variance.

Discussion/Conclusion

The results from the analyses show that the causes of rising between-workplace inequality are myriad. I tested a series of twelve hypotheses that focused on how changes in employment institutions, labor union dynamics, and the structure of the economy could all influence rising between-workplace inequality, either by themselves or in conjunction with other institutions. Most of these items were drawn from the broader literature on income inequality in general, where issues around the declining power of labor (cite), the growing dominance of finance (cite), and the shift towards greater levels of globalization and increasingly open markets (cite) have become prominent.

Both characteristics that increased between-workplace inequality and decreased between-workplace inequality were identified in this study. Concerning Employment Institutions, I tested hypotheses related to the level of wage-bargaining coordination, the strength of employment protection legislation (EPL) regarding temporary contracts, and the discrepancy between regular and temporary contract EPL.

Inconsistent with prior literature (Simón 2010), I did not find that more centralized wage-bargaining was related to declining between-workplace inequality, on the contrary the long term effect was associated with increased inequality both between and within workplaces. However, it

should be stressed that the variable used to measure wage-bargaining centralization has seen only limited amounts of change in the time studied, which could influence findings here.

Consistent with prior literature (Tomaskovic-Devey et al. 2020), higher levels of temporary contract EPL were associated with declining between-workplace inequality. Further, larger gaps in strength between regular and temporary contract (my measure of labor market dualization) were also associated with rising between-workplace inequality. Such findings point to the increasing polarization of firms into "high-road" and "low-road" firms in which workers in certain sectors of the economy reap the benefits of greater legal protections and other regulations while other workers face the full brunt of an unregulated, volatile labor market.

Concerning Labor Union Dynamics, much of the results were in line with what one would expect given the evidence from prior literatures. Both declining union density and collective bargaining coverage were associated with rising between-workplace inequality. Both Card et al. (2013), for Germany, and Tomaskovic-Devey et al. (2020), for a set of thirteen high-income countries, found similar associations.

In addition to measures of labor movement strength, I also attempted to examine aspects of the labor movement's shape and character by examining rates of membership concentration and the extent of authority labor leaders have over their members. I did this both at the union level and at the wider confederation level, which proved to be interesting in that they had markedly different relationships with between-workplace inequality. Rising levels of both membership concentration and authority of confederation leaders was associated with declining between-workplace inequality. For union density, rising membership concentration and authority of union leaders was associated with *rising* between-workplace inequality. These aspects of labor movements have received extremely limited attention in the literature, so more research is

needed to understand why this would be the case. One possible explanation may lie in the fact that confederations almost by definition must take into account a much wider, more heterogenous group of workers than individual workers. For example, for much of Sweden's post-war political economy very large confederations like the LO were responsible for leading wage-bargaining processes that would impact a very large section of the economy. The growth of between-workplace inequality has come at a time when membership concentration in confederation has been on the decline as unions increasingly belong to confederations that serve a narrower group of workers (e.g. the SACO confederation, which is composed of the professional classes). In contrast, the concentration of members into increasingly larger unions can open up the possibility that countries will see strong institutional differences between different sectors of the economy. The consummate example of this is Germany, a country characterized by both large levels of union membership concentration[1], strong between-sector discrepancies in the strength of the labor movement, and high between-workplace inequality. Large, powerful unions like the steelworker union IG Metall can dominate the economy and provide high wages and other benefits for their workers without being beholden to workers in other parts of the economy. Consistently, Germany has also seen the largest increase in between workplace inequality documented in the literature.

Concerning shifts in economic structure, results largely followed expectations. Rising levels of financial and trade globalization, were implicated in rising income inequality in general, and rising between-workplace inequality in particular. Additionally, an increase service sector size was also associated with rising between-workplace inequality, whereas larger manufacturing sector sizes were associated with declining between-workplace inequality. Interestingly, these

[1] It is true that membership concentration at the confederational level is also high in Germany, but confederations in Germany do not have much in the way of actual authority. Rather, unions are the dominant actors.

effects were robust even when controlling for a series of labor market institutions (see Table AX in the Appendix). I had in part expected any service/manufacturing effects to be related to the often strong differences in labor union strength between service and manufacturing sectors. The fact that these results were not simply explained by discrepancies in union density, bargaining coverage, and related factors means that more research is needed to understand exactly why service sectors would increase between-workplace inequality. One possibility is that service sectors tend to be more heterogenous in terms of their labor market institutions compared to manufacturing sectors. Recent studies in Europe, for example, have shown that industries within the service sector (retail, hair salons, hotels, etc.) can see dramatic differences in institutional features like union density or wage-bargaining coordination, whereas industries within manufacturing tend to be more similar over all (Bechter et al. 2011; Bechter et al. 2012). Finally, I also tested how various aspects of labor unions, employment institutions, and economic structure interacted with two common measures of union strength: union density and collective bargaining coverage. Specific hypotheses were not established for these interactions, and I consider them to be largely exploratory in nature. In general, what I find is that rising levels of union density and collective bargaining coverage has a tendency to blunt the between-workplace inequality-generating aspects of several items. Labor market dualization, for example, does not seem to generate as much between-workplace inequality under conditions of higher union density. Likewise, union membership concentration, which was somewhat puzzlingly associated with high between-workplace inequality in the main effect models, negatively interacts with rising union density. This finding could suggest that the initial finding that rising union membership concentration is associated with rising between-workplace inequality was a consequence of unions largely concentrating in certain sectors of the economy (e.g.

manufacturing sectors), which becomes more difficult as union density grows larger. The one exception to this general trend is concerns trade globalization. The interaction between union density and trade globalization was positive, indicating that trade globalization is associated with greater increases in between-workplace inequality when union density is also high. More research is needed to understand exactly why this would be the case.

Broadly speaking, many of the items in this study that were associated with increasing between-workplace inequality have also been previously identified as inequality-generating in prior literatures focusing on total income inequality. Models on between-workplace and within-workplace income variance here often showed that many of items examined here impact both types of inequality but had a stronger impact on between-workplace inequality. The close association between characteristics that increase between-workplace inequality and characteristics that increase total income inequality should not come as a surprise. Prior research has shown that workplace dynamics play a central role in income inequality. Avent-Holt et al. (2019) and Tomaksovic-Devey et al. (2020) have recently shown that the bulk of rising inequality since at least the early 1990s has been driven by rising between-workplace inequality. This is all the more reason for scholars to try to understand what is causing rising between-workplace inequality across advanced, industrialized countries. This paper has primarily shown that the declining strength of labor, the increasing economic trends of financialization and globalization, and the dualization of labor markets into protected and unprotected classes of workers have all played important roles.

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Appendix: Models 4A-18

Table 4A: Inequality Models of Union Density Interacted with Collective Bargaining Coverage - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.206***	-0.055			-0.148***	-0.034			-0.202***	-0.038		
▲Union Density	0.001***	0	0.007***	0	0.001***	0	0.005***	0	0	0	0	0
▲Bargaining Coverage	-0.002***	0	-0.007***	-0.001	-0.001***	0	-0.005***	0	0.001***	0	0.003***	0
▲Union Density * ▲Bargaining Coverage	-0.001*	0	-0.003***	0	-0.000**	0	-0.003***	0	0	0	0	0
Lagged Union Density	-0.005***	-0.001	-0.026***	-0.002	-0.003***	-0.001	-0.023***	-0.001	0.001	-0.001	0.005***	-0.001
Lagged Bargaining Coverage	-0.003***	-0.001	-0.014***	-0.001	-0.001***	0	-0.009***	0	0.001*	-0.001	0.006***	-0.001
Lagged Union Density * Lagged Bargaining Coverage	0.000***	0	0.000***	0	0.000***	0	0.000***	0	-0.000*	0	-0.000***	0
Manufacturing	-0.005**	-0.002	-0.022***	-0.001	-0.002	-0.001	-0.014***	-0.001	-0.001	-0.001	-0.005***	-0.001
Service	-0.005***	-0.001	-0.022***	-0.001	-0.002**	-0.001	-0.017***	-0.001	-0.001	-0.001	-0.004***	-0.001
Trade Globalization	0	0	0	0	0	0	0	0	0	-0.001	0.002***	-0.001
Financial Globalization	0	0	0.002***	0	0.001**	0	0.004***	0	0	0	0.002***	0
Unemployment Rate	0.002*	-0.001	0.011***	-0.002	0.001**	-0.001	0.008***	-0.001	-0.002	-0.001	-0.008***	-0.001
Labor Force Participation	0.001	-0.001	0.004***	-0.001	0	0	0	0	-0.001	-0.001	-0.003***	-0.001
▲yhat			-3.852***	-0.267			-5.774***	-0.229			-3.944***	-0.189
Constant	0.580***	-0.142	2.813***	-0.126	0.299***	-0.095	2.024***	-0.086	0.094	-0.096	0.466***	-0.111
Observations	143		143		143		143		143		143	
R-squared	0.365		0.851		0.293		0.923		0.26		0.761	
Number of Countries	13		13		13		13		13		13	

Table 4B: Inequality Models of Union Density Interacted with Collective Bargaining Coverage - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.236***	-0.062			-0.208***	-0.056			-0.194***	-0.048		
▲ Union Denity	0.002***	0	0.007***	0	0.001***	0	0.003***	0	0	0	-0.002***	0
▲Bargaining Coverage	-0.001**	-0.001	-0.005***	-0.001	-0.001***	0	-0.003***	0	0.001***	0	0.004***	0
▲Union Density * ▲Bargaining Coverage	0	0	-0.002***	0	-0.000*	0	-0.001***	0	0	0	0.001*	0
Lagged Union Density	-0.004***	-0.001	-0.019***	-0.001	-0.004***	-0.001	-0.018***	0	0	-0.001	-0.001*	-0.001
Lagged Bargaining Coverage	-0.002**	-0.001	-0.010***	-0.001	-0.001***	0	-0.006***	0	0.001*	-0.001	0.005***	0
Lagged Union Density * Lagged Bargaining Coverage	0.000***	0	0.000***	0	0.000***	0	0.000***	0	0	0	-0.000***	0
Level of Wage-Bargaining	-0.004	-0.005	-0.015**	-0.005	-0.002	-0.003	-0.009***	-0.003	0.002	-0.002	0.008***	-0.002
EPL Dualization	0.001	-0.002	0.004	-0.002	0.007**	-0.003	0.032***	-0.002	0.004***	-0.001	0.019***	-0.001
Unemployment Rate	0.002**	-0.001	0.008***	-0.001	0.001	0	0.003***	0	-0.001	-0.001	-0.007***	-0.001
Labor Force Participation	0	-0.001	0	-0.001	-0.001**	0	-0.005***	-0.001	-0.001	-0.001	-0.005***	-0.001
▲yhat			-3.228***	-0.263			-3.806***	-0.27			-4.153***	-0.248
Constant	0.224**	-0.079	0.945***	-0.081	0.211***	-0.042	1.013***	-0.037	0.1	-0.068	0.514***	-0.085
Observations	143		143		143		143		143		143	
R-squared	0.329		0.843		0.265		0.92		0.2		0.742	
Number of Countries	13		13		13		13		13		13	

Table 5A: Inequality Models of Union Density Interacted with Centralized Union Authority - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.173***	-0.039			-0.149*	-0.068			-0.231***	-0.053		
▲ Union Denity	0.001***	0	0.006***	0	0.001***	0	0.005***	0	0	0	0.001***	0
▲Centralized Union Authority	0.118	-0.08	0.681***	-0.096	0.21	-0.132	1.408***	-0.094	0.055	-0.095	0.239**	-0.09
▲Union Density * ▲Centralized Union Authority	0.017	-0.118	0.1	-0.12	0.034	-0.048	0.228***	-0.042	-0.018	-0.064	-0.078	-0.063
Lagged Union Density	0	0	0.002***	0	0.001	0	0.004***	0	0	0	0	0
Lagged Centralized Union Authority	0.131***	-0.019	0.757***	-0.042	0.146*	-0.074	0.980***	-0.022	0.021	-0.036	0.093**	-0.033
Lagged Union Density * Lagged Centralized Union Authority	-0.001	-0.001	-0.005***	-0.001	-0.002	-0.002	-0.015***	-0.001	0	-0.001	-0.002*	-0.001
Manufacturing	0.003	-0.003	0.019***	-0.003	0.001	-0.002	0.009***	-0.002	0	-0.002	0.001	-0.002
Service	0.003	-0.002	0.016***	-0.002	0.001	-0.001	0.004**	-0.001	0	-0.002	-0.001	-0.002
Trade Globalization	0	0	0.001***	0	0.000*	0	0.002***	0	0	0	0.001***	0
Financial Globalization	0	0	0	0	0.000**	0	0.003***	0	0.000*	0	0.002***	0
Unemployment Rate	0	-0.001	0.002**	-0.001	0	-0.001	0.002***	-0.001	-0.001	-0.001	-0.004***	-0.001
Labor Force Participation	-0.001	-0.001	-0.004***	-0.001	-0.001*	-0.001	-0.007***	0	0	0	-0.002***	-0.001
▲yhat			-4.766***	-0.227			-5.719***	-0.457			-3.336***	-0.228
Constant	-0.194	-0.262	-1.118***	-0.264	-0.061	-0.148	-0.409**	-0.163	0.046	-0.155	0.199	-0.164
Observations	171		171		171		171		171		171	
R-squared	0.181		0.863		0.261		0.932		0.195		0.75	
Number of Countries	12		12		12		12		12		12	

Table 5B: Inequality Models of Union Density Interacted with Centralized Union Authority - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.171***	-0.031			-0.121**	-0.046			-0.216***	-0.034		
▲ Union Denity	0.001***	0	0.005***	0	0.001***	0	0.004***	0	0	0	0	0
▲Centralized Union Authority	0.144*	-0.078	0.846***	-0.092	0.209	-0.146	1.732***	-0.088	0.041	-0.104	0.192*	-0.102
▲Union Density * ▲Centralized Union Authority	0.001	-0.123	0.005	-0.123	0.026	-0.053	0.220***	-0.047	-0.022	-0.064	-0.101	-0.063
Lagged Union Density	0	0	0.002***	0	0	0	0.002***	0	-0.000*	0	-0.001***	0
Lagged Centralized Union Authority	0.165***	-0.041	0.969***	-0.036	0.101	-0.065	0.841***	-0.038	-0.025	-0.032	-0.114***	-0.034
Lagged Union Density * Lagged Centralized Union Authority	-0.001	-0.001	-0.009***	-0.001	-0.002	-0.001	-0.015***	-0.001	0	-0.001	0	-0.001
Level of Wage-Bargaining	-0.001	-0.003	-0.007**	-0.003	-0.001	-0.001	-0.004**	-0.001	0.001	-0.001	0.005***	-0.001
EPL Dualization	-0.004	-0.003	-0.022***	-0.002	0.002	-0.002	0.015***	-0.002	0.003	-0.002	0.016***	-0.003
Unemployment Rate	0	-0.001	0.001	-0.001	0	0	-0.002***	0	-0.001	-0.001	-0.006***	-0.001
Labor Force Participation	-0.001	-0.001	-0.003***	-0.001	-0.001*	-0.001	-0.010***	-0.001	-0.001	-0.001	-0.002**	-0.001
▲yhat			-4.865***	-0.18			-7.292***	-0.378			-3.635***	-0.155
Constant	0.082	-0.061	0.479***	-0.063	0.097*	-0.049	0.806***	-0.057	0.103	-0.071	0.476***	-0.083
Observations	171		171		171		171		171		171	
R-squared	0.183		0.863		0.206		0.927		0.169		0.742	
Number of Countries	12		12		12		12		12		12	

Table 6A: Inequality Models of Union Density Interacted with Union Membership Concentration - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.177***	-0.04			-0.097**	-0.039			-0.225***	-0.046		
▲ Union Denity	0.001***	0	0.006***	0	0.001***	0	0.007***	0	0	0	0.001***	0
▲Union Membership Concentration	0.124	-0.092	0.699***	-0.11	0.309*	-0.155	3.183***	-0.144	0.136	-0.122	0.604***	-0.112
▲Union Density * ▲Union Membership Concentration	0.028	-0.135	0.156	-0.139	0.038	-0.04	0.393***	-0.042	-0.013	-0.068	-0.056	-0.067
Lagged Union Density	0	0	0.002***	0	0	0	0.002***	0	0	0	0	0
Lagged Union Membership Concentration	0.194***	-0.026	1.094***	-0.055	0.131*	-0.068	1.350***	-0.03	0.013	-0.042	0.058	-0.04
Lagged Union Density * Lagged Union Membership Concentration	-0.001	-0.001	-0.008***	-0.001	-0.001	-0.002	-0.013***	-0.001	0	-0.001	0.001	-0.001
Manufacturing	0.003	-0.003	0.018***	-0.003	0.001	-0.002	0.013***	-0.002	0	-0.001	0.001	-0.001
Service	0.003	-0.002	0.016***	-0.002	0	-0.001	0.005***	-0.001	0	-0.001	-0.002	-0.002
Trade Globalization	0	0	0.001**	0	0	0	0.003***	0	0	0	0.001***	0
Financial Globalization	0	0	0	0	0.000**	0	0.004***	0	0.000*	0	0.002***	0
Unemployment Rate	0	-0.001	0.002**	-0.001	0	0	0.005***	-0.001	-0.001	-0.001	-0.003***	-0.001
Labor Force Participation	-0.001	-0.001	-0.003***	-0.001	-0.001	-0.001	-0.008***	-0.001	0	-0.001	-0.001	-0.001
▲yhat			-4.639***	-0.228			-9.286***	-0.398			-3.451***	-0.207
Constant	-0.194	-0.243	-1.094***	-0.243	-0.059	-0.129	-0.607***	-0.139	0.047	-0.14	0.21	-0.149
Observations	171		171		171		171		171		171	
R-squared	0.181		0.863		0.282		0.934		0.209		0.754	
Number of Countries	12		12		12		12		12		12	

Table 6B: Inequality Models of Union Density Interacted with Union Membership Concentration - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.174***	-0.031			-0.100***	-0.032			-0.216***	-0.031		
▲ Union Denity	0.001***	0	0.005***	0	0.000**	0	0.005***	0	0	0	0	0
▲Union Membership Concentration	0.149	-0.09	0.858***	-0.106	0.313*	-0.168	3.137***	-0.104	0.129	-0.14	0.596***	-0.137
▲Union Density * ▲Union Membership Concentration	0.015	-0.136	0.086	-0.137	0.046	-0.043	0.465***	-0.044	-0.003	-0.076	-0.012	-0.076
Lagged Union Density	0	0	0.002***	0	0	0	0.001***	0	0	0	-0.001***	0
Lagged Union Membership Concentration	0.249***	-0.056	1.432***	-0.055	0.108	-0.069	1.084***	-0.053	-0.04	-0.043	-0.187***	-0.046
Lagged Union Density * Lagged Union Membership Concentration	-0.002**	-0.001	-0.014***	-0.001	-0.002	-0.001	-0.016***	-0.001	0.001	-0.001	0.002**	-0.001
Level of Wage-Bargaining	-0.001	-0.003	-0.007*	-0.003	0	-0.001	-0.004**	-0.001	0.001	-0.001	0.005***	-0.001
EPL Dualization	-0.004	-0.002	-0.022***	-0.002	0.002	-0.002	0.024***	-0.002	0.004	-0.003	0.017***	-0.003
Unemployment Rate	0	-0.001	0.001	-0.001	0	0	-0.002***	0	-0.001	-0.001	-0.006***	-0.001
Labor Force Participation	0	-0.001	-0.002**	-0.001	-0.001	-0.001	-0.011***	-0.001	0	-0.001	-0.002*	-0.001
▲yhat			-4.749***	-0.179			-9.015***	-0.316			-3.636***	-0.145
Constant	0.083	-0.065	0.476***	-0.069	0.093	-0.057	0.928***	-0.071	0.095	-0.077	0.438***	-0.088
Observations	171		171		171		171		171		171	
R-squared	0.183		0.863		0.242		0.93		0.185		0.746	
Number of Countries	12		12		12		12		12		12	

Table 7: Inequality Models of Union Density Interacted with EPL Dualization - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.173***	-0.05			-0.077**	-0.028			-0.232***	-0.045		
▲ Union Denity	0.001**	0	0.007***	-0.001	0.001***	0	0.009***	0	0	0	0.001***	0
▲EPL Dualization	-0.001	-0.003	-0.004	-0.003	-0.001	-0.002	-0.011***	-0.002	0.001	-0.002	0.003*	-0.002
▲Union Density * ▲EPL Dualization	0	-0.001	-0.001	-0.001	-0.001	-0.001	-0.008***	-0.001	0	-0.001	-0.001*	-0.001
Lagged Union Density	0	0	0.001**	0	0	0	-0.001***	0	0	0	-0.001**	0
Lagged EPL Dualization	0.006	-0.009	0.033***	-0.01	0.005	-0.004	0.064***	-0.004	0	-0.002	-0.002	-0.002
Lagged Union Density * Lagged EPL Dualization	0	0	-0.001***	0	0	0	-0.001***	0	0	0	0.000***	0
Manufacturing	-0.002	-0.003	-0.013***	-0.003	0	-0.002	0.003*	-0.002	0.001	-0.001	0.002**	-0.001
Service	-0.001	-0.002	-0.007***	-0.002	0	-0.001	-0.003**	-0.001	0	-0.001	0	-0.001
Trade Globalization	0	0	0	0	0	0	0	0	0	0	0.001*	0
Financial Globalization	0	0	0.001***	0	0.000***	0	0.006***	0	0.000**	0	0.002***	0
Unemployment Rate	0	-0.001	0.002**	-0.001	0.001	0	0.007***	0	-0.001	-0.001	-0.004***	-0.001
Labor Force Participation	-0.001	-0.001	-0.003***	-0.001	-0.001**	0	-0.014***	-0.001	0	0	-0.002***	-0.001
▲yhat			-4.781***	-0.29			-11.946***	-0.364			-3.304***	-0.196
Constant	0.246	-0.224	1.421***	-0.193	0.065	-0.108	0.840***	-0.099	0.033	-0.097	0.144	-0.103
Observations	190		190		190		190		190		190	
R-squared	0.151		0.823		0.17		0.919		0.185		0.754	
Number of Countries	13		13		13		13		13		13	

Table 8: Inequality Models of Union Density Interacted with Domestic Financialization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.159***	-0.045			-0.108***	-0.029			-0.217***	-0.043		
▲ Union Denity	0.001***	0	0.008***	0	0.001***	0	0.007***	0	0	0	0	0
▲Domestic Financialization	0	0	0.000***	0	0	0	0.000***	0	0	0	0	0
▲Union Density * ▲Domestic Financialization	0	0	0.001***	0	0	0	-0.000**	0	0	0	0	0
Lagged Union Density	0	-0.001	-0.001**	0	0	0	-0.003***	0	0	0	-0.001***	0
Lagged Domestic Financialization	0	0	0.000***	0	0.000**	0	0.000***	0	0	0	0.000***	0
Lagged Union Density * Lagged Domestic Financialization	0	0	0.000***	0	0	0	0.000***	0	0	0	0	0
Level of Wage-Bargaining	0	-0.003	-0.002	-0.003	0	-0.002	0.001	-0.002	0.001	-0.001	0.005***	-0.001
EPL Dualization	0.002	-0.003	0.010***	-0.003	0.004	-0.002	0.039***	-0.002	0.003**	-0.001	0.012***	-0.001
Unemployment Rate	0.001	-0.001	0.007***	-0.001	0	-0.001	0.003***	0	-0.001	-0.001	-0.006***	-0.001
Labor Force Participation	0	-0.001	-0.001	-0.001	-0.001**	0	-0.010***	0	-0.001	-0.001	-0.002**	-0.001
▲yhat			-5.297***	-0.281			-8.225***	-0.267			-3.601***	-0.199
Constant	0.083	-0.067	0.522***	-0.064	0.100**	-0.035	0.919***	-0.038	0.099	-0.067	0.457***	-0.082
Observations	173		173		173		173		173		173	
R-squared	0.169		0.823		0.156		0.918		0.145		0.743	
Number of Countries	13		13		13		13		13		13	

Table 9: Inequality Models of Union Density Interacted with Manufacturing Sector Size - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.169**	-0.056			-0.087**	-0.036			-0.215***	-0.042		
▲ Union Denity	0.001	-0.001	0.004***	-0.001	0	0	0.003***	0	0	0	0.001**	0
▲Manufacturing	-0.002	-0.001	-0.010***	-0.001	0	-0.001	-0.001	-0.001	0.001	-0.001	0.003***	-0.001
▲Union Density * ▲manufacturing	-0.001	-0.001	-0.003***	-0.001	0	0	-0.005***	0	0	0	0.001***	0
Lagged Union Density	0	-0.001	0.002**	-0.001	-0.001	-0.001	-0.007***	-0.001	0	0	-0.002***	0
Lagged Manufacturing	-0.001	-0.001	-0.005***	-0.001	0	-0.001	-0.005***	-0.001	0	-0.001	-0.001**	-0.001
Lagged Union Density * Lagged Manufacturing	0	0	0	0	0	0	0.000***	0	0	0	0.000**	0
Level of Wage-Bargaining	-0.001	-0.003	-0.003	-0.003	0	-0.001	-0.002	-0.001	0.001	-0.001	0.005***	-0.001
EPL Dualization	0.001	-0.003	0.006*	-0.003	0.004	-0.003	0.044***	-0.002	0.002	-0.002	0.010***	-0.002
Unemployment Rate	0	-0.001	0.002**	-0.001	0	0	0	0	-0.001	-0.001	-0.005***	-0.001
Labor Force Participation	-0.001	-0.001	-0.004***	-0.001	-0.001**	0	-0.014***	-0.001	0	-0.001	-0.002**	-0.001
▲yhat			-4.930***	-0.335			-10.555***	-0.412			-3.643***	-0.197
Constant	0.140*	-0.067	0.829***	-0.067	0.122**	-0.05	1.415***	-0.043	0.094**	-0.042	0.435***	-0.056
Observations	187		187		187		187		187		187	
R-squared	0.145		0.82		0.124		0.914		0.145		0.741	
Number of Countries	13		13		13		13		13		13	

Table 10: Inequality Models of Union Density Interacted with Service Sector Size - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.172***	-0.045			-0.096***	-0.03			-0.220***	-0.045		
▲ Union Denity	0.001	-0.001	0.003***	-0.001	0	0	0.003***	0	0	0	0.001*	0
▲Service	0.001	-0.001	0.003***	-0.001	0	-0.001	-0.001	-0.001	-0.001	-0.001	-0.003***	-0.001
▲Union Density * ▲Service	0.001	-0.001	0.004***	0	0	0	0.004***	0	0	0	-0.000**	0
Lagged Union Density	0	-0.001	-0.001	-0.001	0	0	0.005***	0	0	0	0.001**	0
Lagged Service	0.001	0	0.003***	0	0	0	0.004***	0	0	0	0.001***	0
Lagged Union Density * Lagged Service	0	0	0	0	0	0	-0.000***	0	0	0	-0.000***	0
Level of Wage-Bargaining	-0.001	-0.003	-0.004	-0.003	0	-0.001	-0.002	-0.001	0.001	-0.001	0.005***	-0.001
EPL Dualization	0.001	-0.003	0.004	-0.003	0.004	-0.003	0.037***	-0.002	0.002	-0.001	0.010***	-0.002
Unemployment Rate	0.001	-0.001	0.003***	-0.001	0	0	0	0	-0.001	-0.001	-0.005***	-0.001
Labor Force Participation	-0.001	-0.001	-0.003***	-0.001	-0.001**	0	-0.013***	0	0	-0.001	-0.002**	-0.001
▲yhat			-4.820***	-0.262			-9.423***	-0.31			-3.537***	-0.203
Constant	0.079	-0.079	0.462***	-0.081	0.087**	-0.035	0.911***	-0.042	0.071	-0.069	0.323***	-0.081
Observations	187		187		187		187		187		187	
R-squared	0.142		0.82		0.125		0.915		0.145		0.741	
Number of Countries	13		13		13		13		13		13	

Table 11: Inequality Models of Union Density Interacted with Trade Globalization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.150***	-0.048			-0.093***	-0.022			-0.226***	-0.035		
▲ Union Denity	0.001***	0	0.007***	0	0.001***	0	0.006***	0	0	0	0	0
▲Trade Globalization	0	0	0.003***	0	0.000*	0	0.003***	0	0	0	0.001***	0
▲Union Density * ▲Trade Globalization	0	0	0.003***	0	0.000**	0	0.004***	0	0.000***	0	0.001***	0
Lagged Union Density	0	-0.001	-0.003***	-0.001	0	0	0	0	0	0	0.002***	0
Lagged Trade Globalization	0	0	0	0	0.000**	0	0.002***	0	0.000***	0	0.002***	0
Lagged Union Density * Lagged Trade Globalization	0	0	0.000***	0	0	0	0	0	0	0	-0.000***	0
Level of Wage-Bargaining	0	-0.003	-0.002	-0.003	0	-0.002	0.001	-0.002	0.001	-0.001	0.005***	-0.001
EPL Dualization	0.001	-0.003	0.004	-0.003	0.004	-0.002	0.039***	-0.002	0.002	-0.001	0.009***	-0.001
Unemployment Rate	0.001	-0.001	0.006***	-0.001	0	0	0	0	-0.001	-0.001	-0.006***	-0.001
Labor Force Participation	0	-0.001	-0.002**	-0.001	-0.001**	0	-0.012***	-0.001	-0.001	-0.001	-0.003***	-0.001
▲yhat			-5.678***	-0.323			-9.811***	-0.236			-3.426***	-0.154
Constant	0.09	-0.075	0.602***	-0.071	0.085**	-0.035	0.922***	-0.045	0.071	-0.053	0.313***	-0.061
Observations	190		190		190		190		190		190	
R-squared	0.146		0.822		0.137		0.916		0.165		0.748	
Number of Countries	13		13		13		13		13		13	

Table 12: Inequality Models of Union Density Interacted with Financial Globalization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.163***	-0.037			-0.099***	-0.022			-0.242***	-0.044		
▲ Union Denity	0.001**	0	0.006***	0	0.001***	0	0.007***	0	0	0	0.000**	0
▲Financial Globalization	0	-0.001	0.001	-0.001	0	0	0.002***	0	0.000*	0	0.002***	0
▲Union Density * ▲Financial Globalization	-0.000**	0	-0.001***	0	-0.000*	0	-0.001***	0	0	0	0	0
Lagged Union Density	0	-0.001	0.002**	-0.001	0	-0.001	0.001**	-0.001	0	0	0.001***	0
Lagged Financial Globalization	0	0	0.003***	0	0	0	0.005***	0	0.000***	0	0.002***	0
Lagged Union Density * Lagged Financial Globalization	0	0	-0.000***	0	0	0	-0.000**	0	0	0	-0.000***	0
Level of Wage-Bargaining	-0.001	-0.003	-0.003	-0.003	0	-0.001	0.001	-0.001	0.001	-0.002	0.004***	-0.001
EPL Dualization	0	-0.004	-0.003	-0.004	0.003	-0.002	0.028***	-0.002	0.002*	-0.001	0.008***	-0.001
Unemployment Rate	0.001	-0.001	0.006***	-0.001	0	0	0.003***	0	-0.001	-0.001	-0.004***	-0.001
Labor Force Participation	0	-0.001	-0.001	-0.001	-0.001**	0	-0.010***	0	0	-0.001	-0.002**	-0.001
▲yhat			-5.147***	-0.228			-9.151***	-0.22			-3.137***	-0.18
Constant	0.063	-0.074	0.386***	-0.068	0.052	-0.038	0.530***	-0.042	0.049	-0.05	0.204***	-0.056
Observations	190		190		190		190		190		190	
R-squared	0.146		0.822		0.165		0.919		0.181		0.753	
Number of Countries	13		13		13		13		13		13	

Table 13A: Inequality Models of Bargaining Coverage Interacted with Centralized Confederational Authority - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.051	-0.068			-0.047	-0.057			-0.262***	-0.077		
▲Bargaining Coverage	-0.001*	-0.001	-0.024***	-0.002	-0.000*	0	-0.009***	-0.001	0.001*	0	0.003***	0
▲Centralized Confederational Authority	-0.133***	-0.023	-2.582***	-0.168	-0.099***	-0.009	-2.092***	-0.123	-0.064*	-0.035	-0.246***	-0.044
▲Bargaining Coverage * ▲Centralized Confederational Authority	-0.034***	-0.01	-0.667***	-0.055	-0.015***	-0.004	-0.310***	-0.02	0.012	-0.008	0.046***	-0.006
Lagged Bargaining Coverage	-0.001**	0	-0.014***	-0.001	0	0	-0.002***	0	0	-0.001	0	-0.001
Lagged Centralized Confederational Authority	-0.138	-0.177	-2.677***	-0.079	-0.066	-0.126	-1.400***	-0.087	-0.143	-0.16	-0.545***	-0.129
Lagged Barg. Coverage * Lagged Cent. Conf. Authority	0.001	-0.002	0.024***	-0.001	0	-0.002	0.009***	-0.001	0.001	-0.002	0.005**	-0.002
Manufacturing	0	-0.004	0.008*	-0.004	0.001	-0.002	0.029***	-0.003	0.001	-0.002	0.002	-0.002
Service	0	-0.003	0.006*	-0.003	0.001	-0.002	0.017***	-0.002	0	-0.002	-0.001	-0.002
Trade Globalization	-0.001	0	-0.011***	-0.001	0	0	0.001	0	0.001	-0.001	0.003**	-0.001
Financial Globalization	0	0	0.003***	0	0.001**	0	0.013***	-0.001	0.001	0	0.002***	0
Unemployment Rate	0	-0.001	0.002*	-0.001	0	0	0.010***	-0.001	-0.001	-0.001	-0.002*	-0.001
Labor Force Participation	-0.001**	0	-0.020***	-0.002	-0.001**	0	-0.018***	-0.001	0	0	0	0
▲yhat			-18.455***	-1.317			-20.168***	-1.213			-2.823***	-0.294
Constant	0.144	-0.311	2.797***	-0.294	-0.059	-0.196	-1.249***	-0.239	-0.004	-0.191	-0.016	-0.19
Observations	124		124		124		124		124		124	
R-squared	0.254		0.865		0.213		0.918		0.28		0.759	
Number of Countries	12		12		12		12		12		12	

Table 13B: Inequality Models of Bargaining Coverage Interacted with Centralized Confederational Authority - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.052	-0.046			-0.075	-0.06			-0.230***	-0.062		
▲Bargaining Coverage	-0.001**	0	-0.025***	-0.002	-0.000**	0	-0.006***	-0.001	0.001*	0	0.003***	0
▲Centralized Confederational Authority	-0.140***	-0.014	-2.684***	-0.129	-0.089***	-0.025	-1.192***	-0.084	-0.038**	-0.016	-0.166***	-0.023
▲Bargaining Coverage * ▲Centralized Confederational Authority	-0.038***	-0.011	-0.731***	-0.043	-0.011**	-0.005	-0.149***	-0.013	0.017**	-0.007	0.074***	-0.004
Lagged Bargaining Coverage	0	0	-0.007***	0	0	0	-0.004***	0	0	0	-0.001**	0
Lagged Centralized Confederational Authority	-0.062	-0.172	-1.178***	-0.129	-0.105	-0.154	-1.401***	-0.086	-0.152	-0.107	-0.660***	-0.078
Lagged Barg. Coverage * Lagged Cent. Conf. Authority	0	-0.002	0.003	-0.002	0.001	-0.002	0.013***	-0.001	0.002	-0.001	0.007***	-0.001
Level of Wage-Bargaining	0.002	-0.005	0.036***	-0.004	-0.001	-0.002	-0.011***	-0.002	-0.001	-0.003	-0.002	-0.003
EPL Dualization	0.002	-0.003	0.047***	-0.004	0.003	-0.003	0.038***	-0.002	0.002	-0.002	0.009***	-0.002
Unemployment Rate	0	-0.001	0	-0.001	0	-0.001	-0.004***	-0.001	-0.001	-0.001	-0.005***	-0.002
Labor Force Participation	-0.001	-0.001	-0.020***	-0.002	-0.001**	-0.001	-0.019***	-0.001	-0.001	-0.001	-0.003***	-0.001
▲yhat			-18.118***	-0.873			-12.340***	-0.806			-3.351***	-0.268
Constant	0.127**	-0.057	2.429***	-0.129	0.148**	-0.067	1.971***	-0.091	0.138**	-0.048	0.602***	-0.079
Observations	124		124		124		124		124		124	
R-squared	0.256		0.866		0.169		0.914		0.204		0.734	
Number of Countries	12		12		12		12		12		12	

Table 14A: Inequality Models of Bargaining Coverage Interacted with Confederational Membership Concentration - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.076	-0.055			-0.05	-0.037			-0.256***	-0.054		
▲Bargaining Coverage	-0.001***	0	-0.018***	-0.001	-0.000***	0	-0.010***	0	0.001**	0	0.002***	0
▲Confederational Membership Concentration	-0.027*	-0.012	-0.357***	-0.024	-0.015***	-0.004	-0.298***	-0.013	-0.008	-0.015	-0.033**	-0.015
▲Bargaining Coverage * ▲Confederational Membership Concentration	-0.014***	-0.003	-0.182***	-0.013	-0.005***	-0.001	-0.110***	-0.004	0.004**	-0.001	0.017***	-0.002
Lagged Bargaining Coverage	0	0	-0.003***	0	0	0	0	0	0	0	0.001***	0
Lagged Confederational Membership Concentration	-0.009	-0.012	-0.119***	-0.013	-0.005	-0.007	-0.100***	-0.008	-0.007	-0.01	-0.027**	-0.01
Lagged Barg. Coverage * Lagged Confederational Membership Concentration	0	0	-0.007***	-0.001	0	0	-0.002***	0	0	0	0.001**	0
Manufacturing	0.003	-0.005	0.042***	-0.005	0.003	-0.002	0.058***	-0.002	0	-0.002	0	-0.002
Service	0.002	-0.003	0.029***	-0.003	0.002	-0.001	0.033***	-0.001	0	-0.002	-0.002	-0.002
Trade Globalization	0	-0.001	-0.004***	-0.001	0	-0.001	0.002***	-0.001	0.001	-0.001	0.004***	-0.001
Financial Globalization	0	0	-0.001***	0	0.001*	0	0.010***	-0.001	0	0	0.002***	0
Unemployment Rate	0.001	-0.001	0.007***	-0.001	0.001	-0.001	0.016***	-0.001	-0.001	-0.001	-0.003***	-0.001
Labor Force Participation	0	-0.001	-0.003***	-0.001	0	0	-0.006***	0	0	-0.001	0	-0.001
▲yhat			-12.214***	-0.731			-19.151***	-0.742			-2.914***	-0.212
Constant	-0.128	-0.346	-1.696***	-0.341	-0.205	-0.157	-4.122***	-0.147	-0.022	-0.221	-0.086	-0.217
Observations	119		119		119		119		119		119	
R-squared	0.251		0.852		0.211		0.915		0.293		0.748	
Number of Countries	13		13		13		13		13		13	

Table 14B: Inequality Models of Bargaining Coverage Interacted with Confederational Membership Concentration - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.066	-0.048			-0.089**	-0.031			-0.228***	-0.056		
▲Bargaining Coverage	-0.001***	0	-0.020***	-0.001	-0.000***	0	-0.006***	0	0.001***	0	0.002***	0
▲Confederational Membership Concentration	-0.022*	-0.01	-0.338***	-0.018	-0.014**	-0.006	-0.157***	-0.007	-0.008	-0.015	-0.034**	-0.014
▲Bargaining Coverage * ▲Confederational Membership Concentration	-0.016***	-0.003	-0.240***	-0.013	-0.006***	-0.001	-0.062***	-0.002	0.006***	-0.002	0.026***	-0.002
Lagged Bargaining Coverage	0	0	-0.004***	0	0	0	-0.001***	0	0	0	0	0
Lagged Confederational Membership Concentration	-0.005	-0.012	-0.074***	-0.013	-0.013	-0.009	-0.145***	-0.007	-0.014	-0.016	-0.060***	-0.013
Lagged Barg. Coverage * Lagged Confederational Membership Concentration	0	0	-0.003***	0	0	0	0.002***	0	0	0	0.002***	0
Level of Wage-Bargaining	0.002	-0.006	0.035***	-0.006	0	-0.003	0.004	-0.003	0.001	-0.003	0.004	-0.003
EPL Dualization	0.001	-0.003	0.016***	-0.004	0.003	-0.003	0.032***	-0.003	0.003*	-0.001	0.011***	-0.002
Unemployment Rate	0	-0.001	0.001	-0.001	0	0	-0.003***	-0.001	-0.001	-0.001	-0.005***	-0.001
Labor Force Participation	-0.001	-0.002	-0.011***	-0.002	-0.001	-0.001	-0.007***	-0.001	0	-0.001	0	-0.001
▲yhat			-14.247***	-0.724			-10.238***	-0.345			-3.385***	-0.248
Constant	0.103	-0.125	1.567***	-0.17	0.069	-0.046	0.772***	-0.059	0.048	-0.096	0.209*	-0.104
Observations	119		119		119		119		119		119	
R-squared	0.246		0.851		0.166		0.91		0.212		0.719	
Number of Countries	13		13		13		13		13		13	

Table 15: Inequality Models of Bargaining Coverage Interacted with EPL Dualization - Economic Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.171	-0.1			-0.097	-0.06			-0.246***	-0.057		
▲Bargaining Coverage	0	-0.001	-0.003**	-0.001	0	0	-0.002***	0	0	0	0.002***	0
▲EPL Dualization	-0.004	-0.002	-0.022***	-0.002	-0.003	-0.002	-0.028***	-0.003	-0.001	-0.002	-0.004*	-0.002
▲Bargaining Coverage * ▲EPL Dualization	-0.004	-0.003	-0.024***	-0.004	-0.002	-0.001	-0.019***	-0.002	0.002	-0.002	0.006***	-0.002
Lagged Bargaining Coverage	0	-0.001	-0.001	-0.001	0	0	-0.001***	0	0	0	0.001**	0
Lagged EPL Dualization	-0.003	-0.009	-0.020**	-0.009	-0.003	-0.005	-0.029***	-0.004	-0.004	-0.003	-0.015***	-0.003
Lagged Barg. Coverage * Lagged EPL Dualization	0	0	0.000**	0	0	0	0.001***	0	0	0	0.000***	0
Manufacturing	-0.002	-0.005	-0.012***	-0.004	0.001	-0.002	0.007***	-0.002	-0.001	-0.002	-0.002	-0.002
Service	-0.001	-0.003	-0.006**	-0.003	0.001	-0.001	0.007***	-0.001	-0.001	-0.002	-0.003	-0.002
Trade Globalization	0	-0.001	0.002***	0	0	0	0	0	0	-0.001	0.001	-0.001
Financial Globalization	0	-0.001	-0.001*	-0.001	0	0	0.003***	0	0.000*	0	0.002***	0
Unemployment Rate	0.001	-0.001	0.003**	-0.001	0	-0.001	0.004***	-0.001	-0.001	-0.001	-0.005***	-0.001
Labor Force Participation	-0.001	-0.001	-0.005***	-0.001	-0.001**	0	-0.014***	-0.001	0	0	-0.001**	0
▲yhat			-4.852***	-0.585			-9.354***	-0.622			-3.064***	-0.23
Constant	0.255	-0.296	1.491***	-0.208	0.033	-0.116	0.337***	-0.103	0.094	-0.174	0.381*	-0.193
Observations	149		149		149		149		149		149	
R-squared	0.162		0.779		0.173		0.898		0.229		0.738	
Number of Countries	13		13		13		13		13		13	

Table 16: Inequality Models of Bargaining Coverage Interacted with Domestic Financialization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.141**	-0.057			-0.087***	-0.017			-0.184***	-0.034		
▲Bargaining Coverage	0	0	-0.002***	-0.001	0	0	-0.002***	0	0	0	0	0
▲Domestic Financialization	0	0	0.000***	0	0	0	0.000***	0	0	0	0	0
▲Bargaining Coverage * ▲Domestic Financialization	-0.000***	0	-0.000***	0	-0.000**	0	-0.000***	0	0.000***	0	0.000***	0
Lagged Bargaining Coverage	0	0	-0.001***	0	0	0	0.000**	0	0	0	0.001***	0
Lagged Domestic Financialization	0.000**	0	0.000***	0	0.000*	0	0.000***	0	0	0	-0.000***	0
Lagged Barg. Coverage * Lagged Domestic Financialization	0	0	-0.000***	0	0	0	0.000***	0	0	0	0.000***	0
Level of Wage-Bargaining	0.003	-0.007	0.021***	-0.007	0	-0.003	0.002	-0.003	0	-0.002	-0.001	-0.002
EPL Dualization	-0.001	-0.004	-0.010**	-0.004	0.001	-0.002	0.017***	-0.002	0.002*	-0.001	0.012***	-0.001
Unemployment Rate	0.001	-0.001	0.010***	-0.001	0.001	-0.001	0.008***	-0.001	-0.001	-0.001	-0.005***	-0.001
Labor Force Participation	0	-0.001	0.001	-0.001	-0.001	-0.001	-0.006***	-0.001	0	-0.001	0	-0.001
▲yhat			-6.088***	-0.403			-10.452***	-0.195			-4.431***	-0.182
Constant	0.044	-0.101	0.314**	-0.111	0.044	-0.046	0.502***	-0.05	0.046	-0.099	0.252**	-0.101
Observations	135		135		135		135		135		135	
R-squared	0.185		0.784		0.165		0.898		0.203		0.73	
Number of Countries	12		12		12		12		12		12	

Table 17: Inequality Models of Bargaining Coverage Interacted with Manufacturing Sector Size - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.160**	-0.068			-0.107**	-0.048			-0.216***	-0.07		
▲Bargaining Coverage	-0.001*	-0.001	-0.007***	-0.001	-0.001**	0	-0.005***	0	0.001	0	0.003***	0
▲Manufacturing	-0.001	-0.001	-0.008***	-0.001	-0.001	-0.001	-0.009***	-0.001	0	-0.001	-0.001	-0.001
▲Bargaining Coverage * ▲Manufacturing	-0.001**	0	-0.007***	0	0	0	-0.004***	0	0	0	0.002***	0
Lagged Bargaining Coverage	-0.001	-0.001	-0.008***	-0.001	-0.001**	0	-0.007***	-0.001	0.001	-0.001	0.004***	-0.001
Lagged Manufacturing	-0.002**	-0.001	-0.010***	0	-0.001*	-0.001	-0.011***	0	0	-0.001	-0.001	-0.001
Lagged Barg. Coverage * Lagged Manufacturing	0	0	0.000***	0	0.000***	0	0.000***	0	0	0	-0.000***	0
Level of Wage-Bargaining	0	-0.007	0	-0.007	0	-0.003	-0.004	-0.003	0.002	-0.003	0.008***	-0.002
EPL Dualization	0	-0.004	0.003	-0.004	0.003	-0.003	0.030***	-0.003	0.001	-0.001	0.007***	-0.001
Unemployment Rate	0.002	-0.001	0.010***	-0.001	0	-0.001	0.003**	-0.001	-0.002*	-0.001	-0.009***	-0.001
Labor Force Participation	0	-0.001	0.003***	-0.001	-0.001	0	-0.007***	0	-0.001	-0.001	-0.004***	-0.001
▲yhat			-5.247***	-0.425			-8.320***	-0.444			-3.639***	-0.324
Constant	0.092	-0.062	0.577***	-0.059	0.110*	-0.052	1.023***	-0.033	0.115**	-0.041	0.535***	-0.055
Observations	149		149		149		149		149		149	
R-squared	0.195		0.787		0.16		0.897		0.192		0.725	
Number of Countries	13		13		13		13		13		13	

Table 18: Inequality Models of Bargaining Coverage Interacted with Service Sector Size - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.150**	-0.057			-0.106**	-0.035			-0.222**	-0.075		
▲Bargaining Coverage	-0.001	-0.001	-0.005***	-0.001	0	0	-0.004***	0	0	0	0.002***	0
▲Service	0.001	-0.002	0.007***	-0.002	0.001	-0.001	0.011***	-0.001	0	-0.001	0	-0.001
▲Bargaining Coverage * ▲service	0	-0.001	0.001**	-0.001	0	0	-0.001*	0	0	0	0	0
Lagged Bargaining Coverage	0.001	-0.001	0.009***	-0.001	0.001***	0	0.008***	0	-0.001	0	-0.003***	0
Lagged Service	0.001**	0	0.007***	0	0.001**	0	0.008***	0	0	0	0.001*	0
Lagged Barg. Coverage * Lagged Service	0	0	-0.000***	0	-0.000**	0	-0.000***	0	0	0	0.000***	0
Level of Wage-Bargaining	0.001	-0.007	0.009	-0.007	0	-0.003	0.001	-0.003	0.001	-0.003	0.006**	-0.002
EPL Dualization	0	-0.004	0	-0.004	0.003	-0.003	0.029***	-0.003	0.002***	-0.001	0.009***	-0.001
Unemployment Rate	0.002**	-0.001	0.014***	-0.001	0	-0.001	0.004***	-0.001	-0.002*	-0.001	-0.009***	-0.001
Labor Force Participation	0	-0.001	0.003***	-0.001	-0.001	-0.001	-0.007***	0	-0.001	-0.001	-0.004***	-0.001
▲yhat			-5.668***	-0.38			-8.404***	-0.334			-3.514***	-0.338
Constant	-0.027	-0.055	-0.181***	-0.055	0.024	-0.025	0.221***	-0.023	0.102*	-0.056	0.460***	-0.082
Observations	149		149		149		149		149		149	
R-squared	0.184		0.784		0.16		0.897		0.195		0.726	
Number of Countries	13		13		13		13		13		13	

Table 19: Inequality Models of Bargaining Coverage Interacted with Trade Globalization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.147**	-0.051			-0.104***	-0.026			-0.239***	-0.043		
▲Bargaining Coverage	-0.001***	0	-0.008***	-0.001	-0.000***	0	-0.004***	0	0.001***	0	0.003***	0
▲Trade Globalization	0	0	-0.001*	0	0	0	-0.001*	0	0	0	0.001***	0
▲Bargaining Coverage * ▲Trade Globalization	0.001***	0	0.010***	-0.001	0.001***	0	0.005***	0	-0.001**	0	-0.003***	0
Lagged Bargaining Coverage	0.001	-0.001	0.007***	-0.001	0	-0.001	0	-0.001	-0.001*	0	-0.003***	0
Lagged Trade Globalization	0.001***	0	0.004***	0	0.000**	0	0.003***	0	0.000*	0	0.001***	0
Lagged Barg. Coverage * Lagged Trade Globalization	-0.000*	0	-0.000***	0	0	0	0	0	0.000*	0	0.000***	0
Level of Wage-Bargaining	0.001	-0.006	0.007	-0.006	0.001	-0.004	0.006*	-0.004	0.002	-0.002	0.010***	-0.001
EPL Dualization	0.005	-0.003	0.035***	-0.004	0.002	-0.002	0.023***	-0.001	-0.003	-0.002	-0.013***	-0.002
Unemployment Rate	0.002*	-0.001	0.010***	0	0	0	0.002***	0	-0.001	-0.001	-0.006***	-0.001
Labor Force Participation	0	-0.001	0.002**	-0.001	-0.001*	-0.001	-0.011***	-0.001	-0.001	-0.001	-0.004***	-0.001
▲yhat			-5.805***	-0.348			-8.617***	-0.254			-3.182***	-0.18
Constant	0.004	-0.067	0.026	-0.067	0.077	-0.045	0.742***	-0.047	0.104**	-0.042	0.435***	-0.052
Observations	149		149		149		149		149		149	
R-squared	0.316		0.819		0.198		0.901		0.292		0.759	
Number of Countries	13		13		13		13		13		13	

Table 20: Inequality Models of Bargaining Coverage Interacted with Financial Globalization - Institutional Controls												
	Model 1: Between-workplace Proportion				*Model 2: Between-workplace Variance*				*Model 3: Within-Workplace Variance*			
	Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects		Short-term Effects		Long-term Effects	
VARIABLES	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Lagged Inequality Item	-0.138***	-0.044			-0.089***	-0.018			-0.243***	-0.053		
▲Bargaining Coverage	-0.001***	0	-0.010***	-0.001	-0.001***	0	-0.007***	0	0.001*	0	0.002***	0
▲Financial Globalization	0	-0.001	0.003***	-0.001	0	0	0.002***	0	0	0	0.002***	0
▲Bargaining Coverage * ▲Financial Globalization	0.000***	0	0.003***	0	0.000**	0	0.003***	0	0	0	-0.000***	0
Lagged Bargaining Coverage	0	0	0	0	0	0	-0.002***	0	0	0	0	0
Lagged Financial Globalization	0.000**	0	0.002***	0	0.000*	0	0.004***	0	0.000***	0	0.002***	0
Lagged Barg. Coverage * Lagged Financial Globalization	0	0	-0.000***	0	0	0	0.000***	0	0	0	0.000***	0
Level of Wage-Bargaining	0.006	-0.007	0.041***	-0.007	0.003	-0.003	0.031***	-0.003	0.001	-0.002	0.005**	-0.002
EPL Dualization	0.001	-0.004	0.005	-0.004	0.002	-0.002	0.028***	-0.002	0.001	-0.001	0.004**	-0.001
Unemployment Rate	0.001	-0.001	0.010***	-0.001	0	0	0.004***	0	-0.001	-0.001	-0.004***	-0.001
Labor Force Participation	0	-0.001	-0.001	-0.001	-0.001*	0	-0.010***	-0.001	0	-0.001	0	-0.001
▲yhat			-6.221***	-0.321			-10.202***	-0.201			-3.110***	-0.217
Constant	0.041	-0.099	0.295**	-0.1	0.042	-0.042	0.466***	-0.045	0.02	-0.074	0.083	-0.076
Observations	149		149		149		149		149		149	
R-squared	0.234		0.798		0.233		0.906		0.237		0.74	
Number of Countries	13		13		13		13		13		13	

CHAPTER 3:
Low-wage Work in Europe:
The Role of Industry and Labor Market Institutions

Introduction

Declining job quality and the growth of "bad jobs" characterized by poor wages and low job security has become a serious concern among policymakers (Boonstra 2012) and scholars (Gautié and Schmitt 2010). Relatedly, scholarly interest in low-wage work has grown as many advanced, industrialized countries have experienced large increases in income inequality following the transition to postindustrial economies (Esping-Andersen 1999). Previous studies have shown that countries vary widely in their levels and trends of low-wage work since the 1970s. Further, an extensive literature has shown that labor market institutions play a central role in setting the levels of low-wage work across countries (Gautié and Schmitt 2010; OECD 1993; Mason and Salverda 2010). In general, countries with institutions that raise worker bargaining power also display markedly lower incidences of low-wage work compared to those without. Much of the cross-country comparative research on low-wage work takes place at the national level and has spent less attention on subnational levels of analysis such as on industries. Some early studies on industry-concentration of low-wage work found that low-wage work tended to pool in a few common industries across national context. Service sector industries such as retail, hotels, or restaurants exhibited large amounts of low-wage work in countries across an array of institutional contexts, from the highly liberalized Anglo countries, to the dualized economies of continental Europe, and to Scandinavia as well (Gautié and Schmitt 2010). Sectors where low-wage workers were comparatively fewer included manufacturing and certain segments of the public sector. This early sectoral work ultimately stressed the commonality of the service sector

as a main low-wage culprit. There is much less knowledge on how the sectoral distribution of low-wage work has shifted in the last several decades. This issue has been exacerbated by the fact that in-depth information on industry-level institutions has not been readily available. As such, statistical modeling of the industry-level relationship between low-wage work and institutions is not possible. Rather, recent qualitative research has documented trends in industrial relations over recent years for particular countries (Baccaro and Howell 2011; Dølvik and Marginson 2018; Howell 2009; Holst 2014), and this literature can be used to shed additional light on the link between industry-level institutional change and low-wage work. Understanding how industries vary across countries in their concentrations of low-wage work is particularly important given that over the last decades industrial relations systems across many European economies have undergone significant shifts. Many of the inequality-reducing characteristics of European economies, particularly centralized collective bargaining, have come under increased assault by employers in the past several decades (Marginson 2015; Leonardi and Pedersini 2018). Some scholars have characterized trends in industrial relations in this time period as a generalized liberalization of previously tightly regulated and coordinated economies (Baccaro and Howell 2017), whereas others have stressed different processes of liberalization (Thelen 2014). Still other scholars have focused on specific institutions, such as the decentralization of wage-bargaining (Marginson 2015) or the deregulation of fixed-term contracts and temporary agency employment (Emmenegger et al. 2012). Because scholars of both low-wage work and industrial relations have generally focused on the country level, it is not clear how these institutional changes have impacted the sectoral character of low-wage work across this time period.

The examination of low-wage work at the industry level is critical given the reality that most countries do not so much have a national model of industrial relations as they do many industry-specific models (Bechter et al. 2011). Such within-country heterogeneity in industrial relations can be exemplified by Germany. While the manufacturing sector in Germany displays all the trappings of what is considered the typical German model (strong collective bargaining coverage, high levels of coordination between social partners, etc.), the German service sector shares only superficial similarities with manufacturing. Bargaining is in principal done at the sectoral level, but since the early 2000s these agreements are not binding, and in practice more and more service sector firms have left bargaining arrangements altogether (Bechter et al. 2011; Leonardi and Pedersini 2018).

Countries differ in how much between-industry differences exist in their industrial relations. Some aspects of institutions inherently apply to all industries within a given country. The French minimum wage, for example, is a national, legal minimum wage and thus affects wages regardless of industry. Many of the Nordic countries have accomplished a level of homogeneity across industries without the use of national measures like minimum wage laws (Bechter et al. 2011; Bechter et al. 2012). Countries with greater disparities in their sectoral industrial relations likely have stronger relationships between industry and low-wage work. This paper focuses on trends related to collective bargaining, deregulation of work contracts, corporatist arrangements, and other relevant institutions, and how these institutional trends relate to trends in the industry-level makeup of low-wage employment across a set of European countries from roughly 1993-2015.

Early studies on low-wage work concluded that low-wage workers were concentrated in poorly organized service sectors such as retail, hoteling, or restaurants. In contrast, workers in highly

unionized, core industries like manufacturing were more likely to be protected from low pay (OECD 1996; Mason and Salverda 2010; Lucifora, McKnight, and Salverda 2005). This paper will show that countries display strong variation in their industry-level composition of low-wage work, and that in some countries low-wage work has most proliferated in relatively unexpected places. For example, Swedish low-wage work has grown most strongly in social services such as education and health, likely a consequence of the spread of decentralized bargaining in those sectors (Baccaro and Howell 2017). Sectors in this analysis include the aforementioned service sector (retail, hotels, etc.), the manufacturing sector, and social services such as health, education, or public administration[2].

I focus my analysis on six European countries: Denmark, Sweden, Germany, France, Czechia, and Slovenia. These countries were chosen for three reasons. First, the two Scandinavian and two Continental European countries are often at the center of the debate around institutional changes in European industrial relations. All four countries, to varying degrees, have grappled with institutional liberalization in the form of bargaining decentralization, cutbacks in welfare state benefits, labor laws, and union decline. Second, early (OECD 1996) and more recent (Gautié and Schmitt 2010) analyses of low-wage employment have typically left out Eastern European economies on the grounds that their statuses as emerging economies and their socialist past made them too qualitatively different to compare alongside Western Europe and North America. However, in the intervening years Eastern European countries have both entered the European Union and have completed their transition towards market economies. Czechia and Slovenia were chosen because they represent the breadth of institutional difference among

[2] These sectors are generally referred to as the public sector. However, the data do not allow us to clearly differentiate between public and private-sector areas in these industries, so we have opted for the broader term "social services."

Eastern European countries, with Czechia having followed a largely liberalizing path and Slovenia adopting corporatist structures much like that of Western Europe. Lastly, all six countries possess highly accurate administrative data on income. Previous studies of low-wage work have tended to suffer from two issues: reliance on survey and household data (European Commision 2004; Robson et al. 1999), and a sample population that consisted only of full-time workers (OECD 1993). Administrative data, in contrast, is a highly accurate source of data when it comes to earnings and wages, much more so than survey data tend to be (Valet et al. 2019). Furthermore, the data are either population-level or huge samples, substantially reducing any sampling error. Reliable information on hours worked also allows for the calculation of hourly earnings excepting only Germany (which comes very close with daily earnings) and Slovenia (which uses monthly earnings). This is particularly important because it lets researchers account for part-time employment. Many of the best sources for low-wage work, such as the OECD, have restricted their analyses to full-time workers only. However, today part-time work is a large and growing segment of nearly all advanced economies, and any accurate analysis of low-wage work must be able to include them.

Low-wage Work and Institutions Across Scandinavia, Continental Europe, and Eastern Europe

In the following sections, I summarize previous research on low-wage work and trends in institutional arrangements for each of the seven countries. I do this for the specific industry groupings mentioned above within each country, as well as for the country as a whole. In general, the Scandinavian countries, despite being institutionally similar in many ways, have sharply different profiles of low-wage work at the industry level. Similarly, Germany and France share some institutional characteristics, such as relatively centralized wage bargaining and a

tendency towards labor market dualization, but at the industry level the concentration of low-wage shows both similarities and strong differences. Finally, the two Eastern European (CEE) countries represent the peak of strong labor market institutions in Eastern Europe with Slovenia, and a more typically liberalized CEE country with Czechia. It is not clear whether CEE labor market institutions serve their intended function or are ineffectual (Ost 2000; Crowley 2004; Bernaciak 2015; Poje 2019; Myant 2019). Ultimately, there are strong differences in low-wage work especially in the service sector, but less so in the social services and especially in manufacturing.

Scandinavia:

Scandinavian countries have long possessed many common characteristics. They share a high degree of market coordination with continental European countries, but several key institutional aspects set them apart. They all maintain exceptionally high levels of collective bargaining coverage. Scandinavian nations place strong emphasis on egalitarianism and inclusive institutions that encompass most of the population. Thus, they have largely avoided issues of labor market dualization (which plague continental Europe) and rampant income inequality (which plague LMEs) (Kenworthy 2004; Emmenegger et al. 2012). Because of these uniquely Scandinavian characteristics, Nordic countries have generally possessed small amounts of low-wage work (Ibsen and Thelen 2017). Scholars have debated whether Scandinavia is experiencing rapid institutional change. Some have argued that Nordic countries have undergone significant liberalization and a collapse in corporatist bargaining arrangements. Bargaining contracts in the public sectors have been greatly hollowed out (Baccaro and Howell 2017). Others have noted that, even accounting for some institutional change, Scandinavian countries have largely retained

their egalitarian ways (Dølvik and Marginson 2018). Below, industrial relations trends in Denmark and Sweden are discussed in greater detail.

In previous studies, Sweden has been marked by some of the lowest levels of low-wage work among advanced, industrialized countries. For example, less than 5% of full-time jobs payed low wages in 1996 (OECD 1996). Close to 90% of Swedish workers have been covered under bargaining in any given year since the early 1990s, the highest percentage in Scandinavia. The actual coverage rate of collective bargaining has remained quite stable since the 1990s, declining only few percentage points at most. However, the size and stability of bargaining coverage masks significant between-industry variation in how bargaining takes place.

For one, Sweden possesses a larger discrepancy in union strength between service and manufacturing industries than Denmark, which is more sectorally homogenous. Union membership in service sectors tends to be much lower in Sweden compared to the manufacturing sector (Bechter et al. 2011), and in general Swedish service sector unions have been much weaker than their manufacturing counterparts. The two largest confederations in this area, Saco and TCO, are also often at odds with each other, whether this is competition over members of divergent goals regarding access to resources such as educational credentials (Kjellberg 2013). On the other hand, service sector unions have taken more prominent roles in the national bargaining rounds after 1995 when the LO began declining in influence (although the LO in general still leads bargaining rounds) (Kjellberg 2011), and service union members also make up increasing shares of the total union membership of Sweden as manufacturing declines in size. Collective bargaining has become increasingly decentralized (Anthonsen, Lindvall, and Schmidt-Hansen 2011; Baccaro and Howell 2011; Andersen, Dølvik, and Ibsen 2014) in some parts of the economy since the early 1990s. Sections of social services, for example among nurses, began

adopting firm-level or individualized bargaining early in the 1990s as a bid towards raising their wages (Baccaro and Howell 2017). These workers were often still covered under industry-wide agreements, but those agreements had been emptied of some of their wage-regulating power. As such, decentralized bargaining has proliferated underneath the sectoral framework.

In comparison to Sweden, Denmark is not quite as egalitarian and has consistently ranked higher in low-wage work than Sweden since at least the early 1990s. The chief distinction between Danish industrial relations compared to their Nordic counterparts can be called "centralized decentralization" (Andersen, Dølvik, and Ibsen 2014). Effectively, bargaining over wages and working conditions occurs at the firm level, but under tight coordination from larger labor and employer confederations. Danish industries tend to be quite homogenous in terms of industrial relations structures (Bechter et al. 2012). Industries as divergent as steel manufacturing and hairdressing have similar rates of union density (Bechter et al. 2011). Even in areas such as call centers, often a bastion of low-wage employment and disorganized and weak unions, Danish companies still feature high union density rates, union power, and union/worker influence on company practice (Sørensen and Weinkopf 2009).

Continental Europe

Germany and France belong to a cluster of continental European countries characterized as "corporatist" or "coordinated" economies, possessing of a high degree of market coordination, high levels of EPL for the core workforce, and powerful, if not numerically strong, labor actors. They share some of this with Nordic countries. The chief difference between Nordic countries and these two is that continental European countries often feature more exclusive labor market institutions. Exclusive industrial relations systems often lead to dualized economies, in which a protected, "core" set of workers exists alongside weaker, vulnerable "peripheral" sectors; both

France and Germany struggle with labor market dualism (Barbieri 2009; Emmenegger et al. 2012). German manufacturing unions especially have been marked by a strong motivation to protect core industries at the growing expense of peripheral sectors (Thelen 2014; Ochsenfeld 2018). Both Germany and France have undergone noticeable transformations in their industrial relations systems since the early 1990s; Germany in particular has felt the effects of these transformations.

The extensive transformations of the German system of industrial relations is by now well known (Baccaro and Howell 2011; Hall and Thelen 2009; Doellgast 2009). Collective bargaining has seen steep declines, increasing amounts of firms have opted out of bargaining agreements altogether (Baccaro and Howell 2017), and the early-2000s Hartz reforms significantly liberalized fixed-term and contract agency work and reduced unemployment benefits. However, these changes have not impacted all sectors equally. The strong distinction between manufacturing and the service sector is most informative here.

The manufacturing sector, especially concerning large manufacturing firms, have only seen small declines in sectoral bargaining coverage and effectively no decline regarding works councils (Baccaro and Howell 2017).On the other hand, temp agency workers have become endemic in manufacturing (Benassi 2016). Works councils have become increasingly comfortable with "sacrificing" peripheral workers through the use of low-road behaviors like contract agency work in order to both satisfy employer demands for flexibility and protect the "core" workforce (Hall and Thelen 2009; Thelen 2014). In comparison to manufacturing, German unions in the service sector have been historically weak (Schulten and Bispinck 2018), and they have seen steep declines in sectoral bargaining coverage and very low levels of works council presence (Baccaro and Howell 2017). With lower levels of union membership and

power, service industry unions such as ver.di have long struggled against increasing employer demands for lower wages and greater labor market flexibility. Even in the mid-1990s, opening clauses had been established for small and medium-sized firms. Today, it is more likely for retail establishments to withdraw from the collective bargaining process altogether. Even in large establishments, coverage among retail workers is now both low and declining (Schulten and Bispinck 2018).

France has not seen the level of institutional change that Germany has. Despite the notoriously low level of union membership in France (less than 10%), unions maintain an impressive amount of power thanks to favorable mandatory extension laws (Caroli and Gautié 2008), resulting in quite high (almost universal) levels of collective bargaining coverage. Like Sweden, these stably high levels hide some important changes in how bargaining occurs. Some scholars have argued that French bargaining is moving towards decentralization (Howell 2009), whereas others have noted an unwillingness among French firms to truly adopt firm-level bargaining (Jobert and Saglio 2005). It is also not clear how, if decentralization is taking place, it is spread across different industries. French service sector unions certainly tend to have all the weaknesses seen in other countries. They are numerically smaller and weaker compared to other sectors. Collective bargaining is overall quite fragmented (Rehfeldt and Vincent 2018). Perhaps most important for low-wage work in France is the minimum wage. The French minimum wage is exceptionally high compared to other advanced countries, roughly equal to 60% of the median wage (Gautié and Schmidt 2010). A strongly universalistic institution like the French minimum wage likely blunts the ability of industries to differ too strongly from each other wage-wise, which places limits on how much low-wage work can concentrate into specific sectors. As such,

there is likely less between-industry heterogeneity in low-wage work in France compared to a country such as Germany which lacks a strong, national minimum wage.

Eastern Europe

Central Eastern European (CEE) countries have generally been left out of cross-comparative research on low-wage employment because researchers considered their socialist past to make them too qualitatively different to Western Europe. However, many CEE countries have now mostly transitioned into market economies and joined the European Union, including Czechia and Slovenia. CEE countries have also followed different institutional paths in their post-socialist transitions, and it is still a question whether CEE labor market institutions matter for low-wage work.

The institutions of these formerly socialist countries differ from Western Europe in several ways. First, although CEE countries established corporatist structures through the 1990s, scholars have generally concluded that these attempts were ineffectual (Ost 2000; Crowley 2004). Much of this research was conducted in the immediate wake of the transition to market societies. It remains to be seen whether this also applies in more recent years. Unions in these countries often have different priorities compared to unions in Western Europe. For example, Pollert's (1999) analysis of Czechian unions found that they did not focus on wage-setting during bargaining sessions, instead emphasizing enforcement of other workplace regulations; wages were typically negotiated at the workplace or individual level and often not included in the bargaining agreement. On the other hand, the largest union confederation in Czechia (the Czech-Moravian Association of Trade Unions) places emphasis on political pressure at the national level, recently winning an increase in the national minimum wage (Myant 2019).

Besides a different kind of socialist past between Czechia and Slovenia, a significant amount of institutional diversity has also emerged in decades since the collapse of the Soviet Union and the break-up of Yugoslavia. Czechia has followed the more typical CEE path of significant market liberalization alongside the effort to maintain some social welfare policies. Slovenia, on the other hand, is the single CEE country which has established truly corporatist institutions comparable to Western Europe (Jahn 2012). Slovenia is in general more sectorally homogenous in terms of labor market institutions compared to Czechia, a country which showed some of the strongest variation in sectoral industrial relations across Europe in study conducted by Bechter et al. (2012).

The peculiarity of the Slovenian case is the result of many factors, including historical worker self-management, geographical propinquity to Western Europe, and a smooth post-socialist transition (Bohle and Greskovitz 2007; Crowley and Stanojevic 2011). Perhaps the most important legacy of the Yugoslavian system is the fact that unions were both exceptionally strong and had excellent mobilization capabilities. The force of the labor movement during the transitionary period into Slovenian independence fully brought them into the governing process of the country following a 1992 general strike wave (Stanojević and Poje 2019). Extension and mandatory participation laws ensured that large portions of workers and employers belonged to bargaining associations.

Although labor and corporatist arrangements remain strong in Slovenia, there are signs that Slovenia has been undergoing liberalization (Bernaciak 2015). Repeals of mandatory participation laws for employers has since led to rapid declines in coverage as employers have exited the system (Stanojevic and Klarič 2013), and firm-level breaches of collective agreements began occurring in the wake of the 2008 financial crisis (Stanojević and Poje 2019). It is not

certain how these changes have impacted low-wage work at the industry level, but it is notable that Slovenia has historically possessed, and continues to possess, quite strong service sector unions in contrast to the other countries in this paper (Poje 2019; Helfferich and Franklin 2019).

Data and Measurement of Low-wage Work

Scholars have used various measures of low-wage work across the field. Some have used absolute levels of income as a cut-off point for low-wage work, as when studying household poverty (Cooke and Lawton 2008). Others have compared income gaps across deciles. This paper operationalizes low-wage jobs as jobs earning less than 2/3rds of the median hourly wage, which is probably the most common definition of low wages used in the literature and possesses many attractive qualities. First, it allows for cross-country comparisons in levels of low-wage work. Secondly, it conceptualizes low-wage work in a way that allows levels to shift over time (as opposed to, say, looking at income deciles). Additionally, this measure is commonly used by important resources like the OECD, the EU, the ETUI, and others.

The data all stem from administrative records. Such data produces highly accurate measures of earnings. The income data in these databases are typically at the monthly level, but most possess reliable information on hours worked, allowing one to calculate a measure of hourly earnings. The two exceptions are Germany, which can still be calculated down to daily earnings, and Slovenia, for which only monthly earnings are available. Monthly earnings for Slovenia are not particularly problematic because part-time work is almost nonexistent in Slovenia, and the chief benefit of using hourly earnings is the adequate accounting for part-time employment. In Denmark and Slovenia, the data are derived from population-level estimates which include all workers, workplaces, industries, etc. In Sweden and Czechia, the data are population level at the public sector but use a huge sample for the private sector. France likewise is nearly population-

level data but does exclude state civil servants. German data stems from a 5% sample of the entire working population (about 20,000 firms and over 1 million jobs). In all countries, jobs with suspiciously low earnings (generally, this is less than 50% of the minimum legal or agreed upon wage) are removed under the assumption that these are administrative errors and not accurate reporting of wages; in practice, this eliminates very few jobs from the analysis. Additionally, the self-employed are also not included. Appendix section A contains further details on country-specific data sources, exclusions, sampling, etc.

Importantly, this study uses gross, *hourly* wages in constructing the measurement of low-wage work (excepting Germany, which uses daily wages). Researchers in this area have variously used either hourly, weekly, or monthly wages to define low-wage employment (Fernández et al. 2004; Marlier and Ponthieux 2000; Grimshaw 2011). The problem with weekly or monthly earnings is that one's wage is highly dependent on how many hours a worker happened to work that week or month (Grimshaw 2011). As part-time and other atypical work continue to grow across advanced, industrialized countries, these measures become more problematic. Some researchers, including the OECD, solve this problem by looking only at full-time employment, but this runs the risk of underestimating the real incidence of low-wage work in a given country. Given the increasing importance of part-time workers in advanced economies, and the fact that part-time workers also make up a sizeable chunk of the low-wage workforce (Fernández et al. 2004), it is highly important to include them in the analysis (Lucifora et al. 2005). By using hourly wages, part-time workers can be adequately accounted for. A common drawback to using hourly wages is that information on hourly wages from household survey data has typically been prone to error because they have been derived from self-reported income and hours worked. The administrative data used here is substantially less prone to such errors.

Countries are compared using concentration ratios. Concentration ratios are a useful measure of comparing the concentration of low-wage work across sectors while taking into account differing national levels of low-wage work and industry size across countries. The ratio is calculated simply as the proportion of low-wage jobs in Industry X divided by the proportion of all jobs in Industry X. As such, industries with concentration ratios higher than 1 are those with outsized proportions of low-wage work, and those below 1 have comparatively low levels of low-wage employment.

National Trends in Low-wage Work: Industry Level

In this next section, low-wage work across industries are examined for each country. Early research tended to focus on the outsized role of sectors like retail and hotels in low-wage work (OECD 1996), but scholars have since mostly ignored industry analyses in favor of occupational or country-level investigations. Almost all research on low-wage work suggests that service sector industries are notable low-wage sectors. Core industries, such as often found in manufacturing, have generally been shown to hold relatively lower levels of low-wage work (OECD 1996; Lucifora et al. 2005). The tables below show the concentration ratio of low-wage work for each country across several select industries.

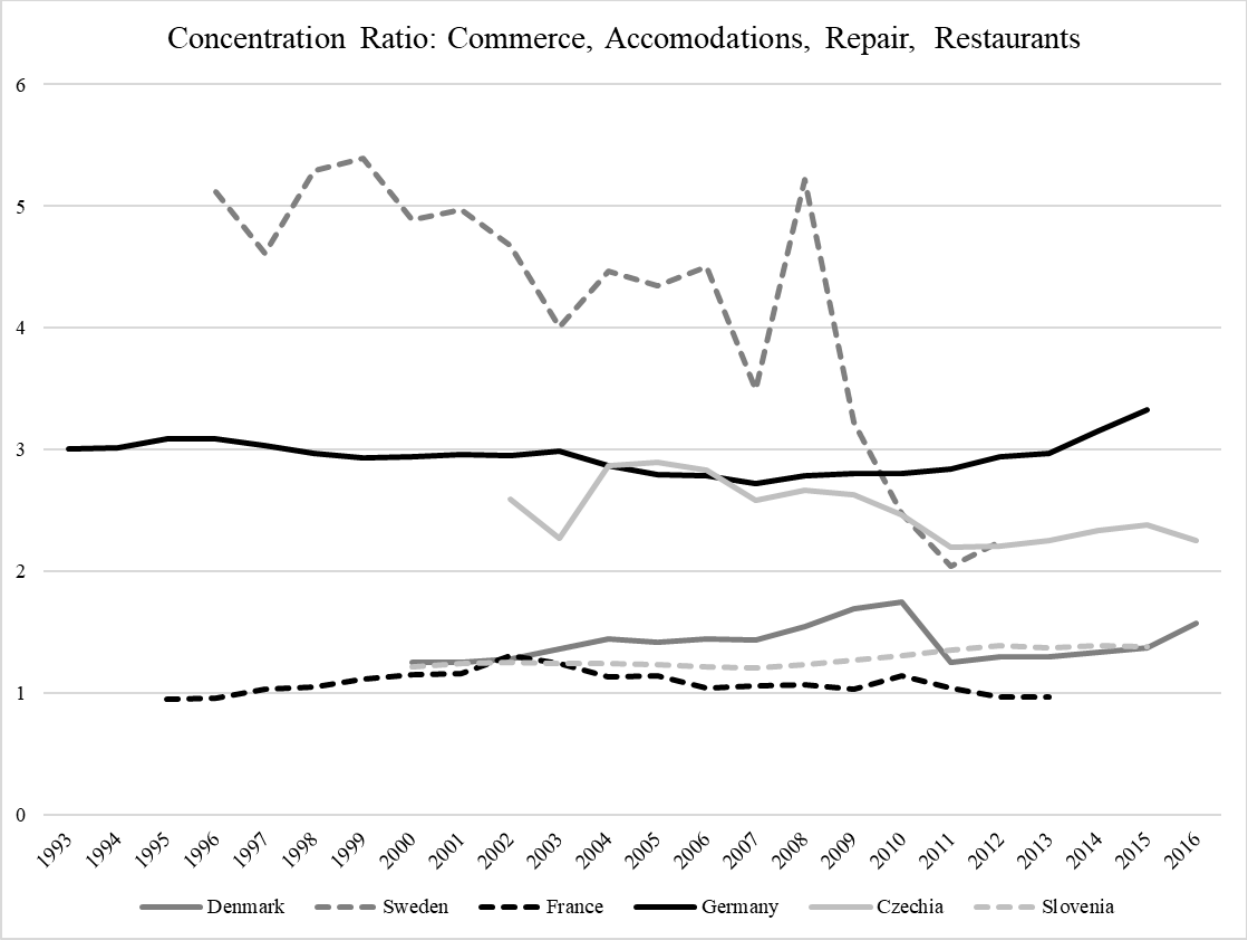

Figure 1: Trends in the concentration ratio for the combined sectors of retail, wholesale, repair, hotels, and restaurants.

The generalization of service industries as important sources of low-wage work bears some truth, as most countries here have high concentrations of low-wage jobs in their service industries, with ratios approaching or exceeding 2. Yet, significant variation in the quality of the service industry exists between countries. France and Slovenia stand out for being the only two countries in this study where the service industries consistently do not have a disproportionate amount of low-wage employment (although it is increasing in Slovenia). Both countries also possess quite strong national minimum wages. In the French case, it seems most likely that the minimum wage is quite important for the service sector given that service sector unions are in general weak and

disorganized (Rehfeldt and Vincent 2018). A strongly universalistic institution like the French minimum wage can blunt the ability of industries to differ too strongly from each other wage-wise, which places limits on how much low-wage work can concentrate into specific sectors. In the Slovenian case, there is a strong minimum wage, but unions in this area are also notably powerful, especially in the commerce sectors, which could also contribute to the relatively low concentration of low-wage work found here (Poje 2019; Helfferich and Franklin 2019, pg. 61). At the high end, Sweden's service industry fits into the expected pattern, with a high concentration ratio for these industries. Sweden is unusual in that low-wage jobs are becoming less concentrated into the service sectors over time, with the concentration ratio dropping from around 5 to around 2. The marked improvement in the service industries could mirror a gradual increase in the bargaining power and strength of service sector unions in Swedish industrial relations, as service sector unions have grown to represent a larger share of the Swedish labor movement (Kjellberg 2013), have increasingly cooperated with each other (Kjellberg 2013), and have taken on more prominent roles in the national bargaining processes (Kjellberg 2011). The concentration of low-wage work in the service industries is also noticeably higher in Sweden than in Denmark. Sweden possesses a larger discrepancy in union strength between service and manufacturing industries than Denmark, which is more sectorally homogenous. Denmark, for example, has managed to maintain fairly high union membership and participation even in typically challenging areas like call centers throughout much of the time period analyzed in this paper (Sørensen and Weinkopf 2009). That being said, the concentration in the Danish service sector is increasing, and it is the case that at least some areas in the service sector, such as the telecommunications industry, have struggled with bargaining decentralization, increasing conflict between unions, and growing income inequality (Benassi, Doellgast, and Sarmiento-

Mirwaldt 2016). It is also important to note that the Swedish sampling structure somewhat affects the sectors in Figure 1. Although observations are weighted accordingly, small businesses are likely still underrepresented in the data, which are in turn more prevalent in these industries than in, say, manufacturing. This helps explain the distinct jaggedness of the line in Figure 1, although the strong downward trend is still correct.

The heavily dualized economy of Germany boasts the consistently highest concentration ratio of low-wage work for the service industry. The concentration is also quite stable, hovering around a ratio of 3 from 1993-2015. The exceptionally high concentration of low-wage work found in the German service industries is not surprising given the well-known weaknesses of German service sector unions and the dualized nature of the German economy, which favors "core" manufacturing sectors over services.

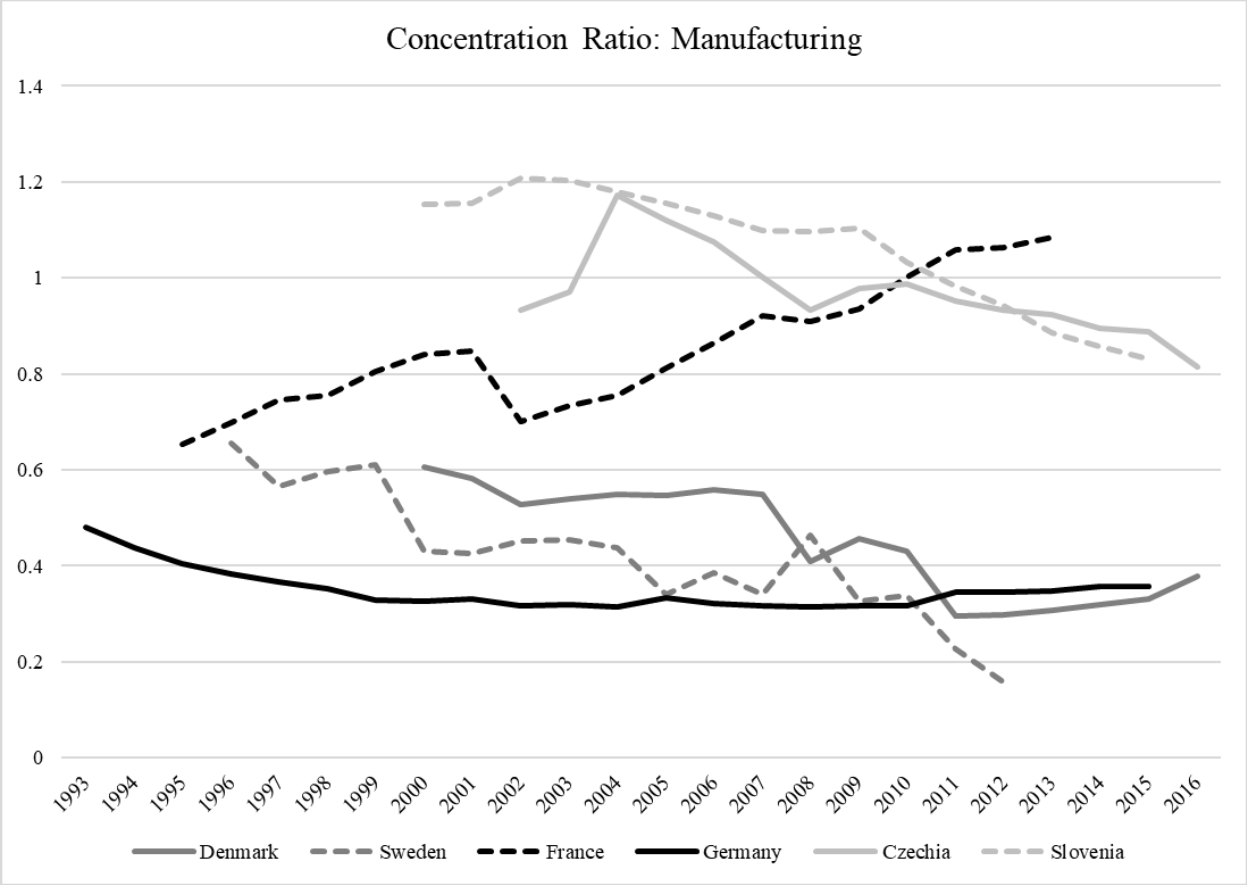

Figure 2: Trends in the concentration ratio for the manufacturing sectors.

Low-wage work does not concentrate in any of the countries examined here. There is also much less variance in low-wage work across countries compared to the service industry. The more homogenous results for manufacturing is in line with the fact that labor market institutions for manufacturing sectors across most advanced, industrialized countries tend to be similarly characterized by high collective bargaining coverage and centralized bargaining (Bechter et al. 2011). Even in Czechia and Slovenia, where Western Europe has offshored much of their low-skilled and low-wage manufacturing jobs, the concentration ratio of low-wage jobs in manufacturing falls below 1 by the end of the time period analyzed here. Swedish and Danish

concentration rations for manufacturing also decline over time, from .66 to .16 and from .67 to .39 respectively.

Consistent with the picture of Germany as a heavily dualized economy possessing a highly privileged manufacturing sector, the concentration ratio of low-wage work in manufacturing is reliably lower in Germany than in any other country examined here (hovering around a score of .35). This may come as a surprise given the large amount of literature that has documented the unraveling of collective bargaining and labor power in German manufacturing (Palier and Thelen 2010; Baccaro and Howell 2017; Holst 2014). Yet, it is important to note that powerful unions like IG Metall have not idly stood by. Efforts have been made to ensure that, even if decentralization of bargaining occurs, it can also be used reinforce labor strength or at least not erode it. For example, while opening clauses have proliferated among manufacturing firms, unions have insisted that they be tolerated only when paired with local union membership input (Bechter et al. 2011). Of course, it is also true that manufacturing companies in Germany have also engaged in significant outsourcing (Benassi 2016). As such, it is likely that many low-wage workers were moved out of the manufacturing sector and into the contract agency sector, even though they are still performing the same duties as before.

France stands out for being the only country where the concentration of low-wage work in manufacturing has been growing, moving from a concentration ratio of .65 in 1995 to about 1.08 in 2013. This shift does not mark manufacturing as a low-wage sector, but it does suggest that job quality in French manufacturing is in decline. It is not clear what the exact cause of the rise in French low-wage manufacturing work is, but bargaining decentralization may play a role. The introduction of several laws (such as the 2004 Fillon law) has encouraged firm-level collective bargaining. Company-level agreements seem to now be quite widespread, although there is still

debate on this (Jobert and Saglio 2005). Bargaining decentralization combined with an increase in "low-road" competitive strategies, with a focus on keeping labor costs low, may explain declining job quality in French manufacturing (Rehfeldt and Vincent 2018).

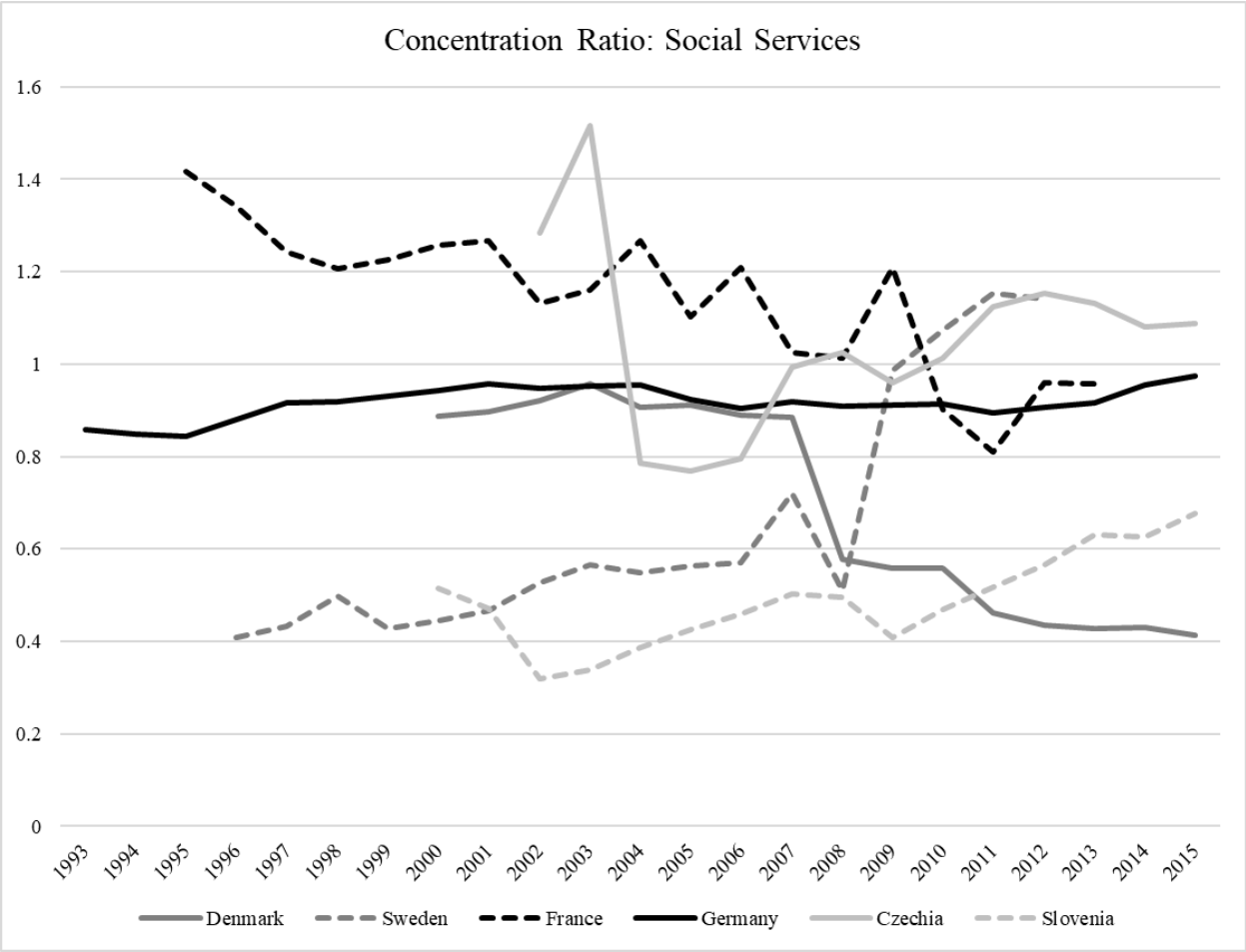

Figure 3: Trends in the concentration ratio for the combined social services sectors (education, health, administration, etc.).

In none of the countries examined can social services be considered clear "low-wage sectors," yet significant differences in levels and trends in low-wage work appear across countries. In Sweden, the social services have seen the largest relative growth in low-wage work over the last several decades. Low-wage jobs in areas such as health and education grew steadily from the mid-1990s to before the Great Recession. The growth in low-wage employment may have

stemmed from the fact that public sector workers were early adopters of individualized wage bargaining (Baccaro and Howell 2017), or from the rise in short-term contracts, increased privatization, and other low-road managerial strategies in these sectors following the recession of the early 1990s (Anxo 2013). The concentration of low-wage work skyrocketed in Sweden's social services during and after the Great Recession. It is not clear if the Great Recession is to blame, but some research shows that the post-recession bargaining sessions for these workers led to much lower wage gains than in previous years (Anxo 2013). Low-wage work in the Danish social services, in contrast, has been much more stable over time. Social services in Denmark were not as privileged as Swedish social services, with fairly average concentrations of low-work through the mid-2000s. Unlike Sweden, the social services have fared better in the wake of the Great Recession, with low-wage concentration seeing significant declines.

The two continental European countries, France and Germany, have similar social services sectors. Low-wage work in France has a somewhat higher concentration of low-wage work in the mid-1990s (concentration ratios of around 1.3 compared to Germany's .9) but declines over time to a level like Germany's. The social services of the two Eastern European countries have markedly different levels of low-wage work but similar trends. Slovenian social services are characterized by a very low concentration ratio of low-wage work, beginning the time period analyzed around .4 and slowly trending upwards to .7. Czechia, on the other hand, begins with a concentration ratio of .8 and from there trends up to a little over 1.

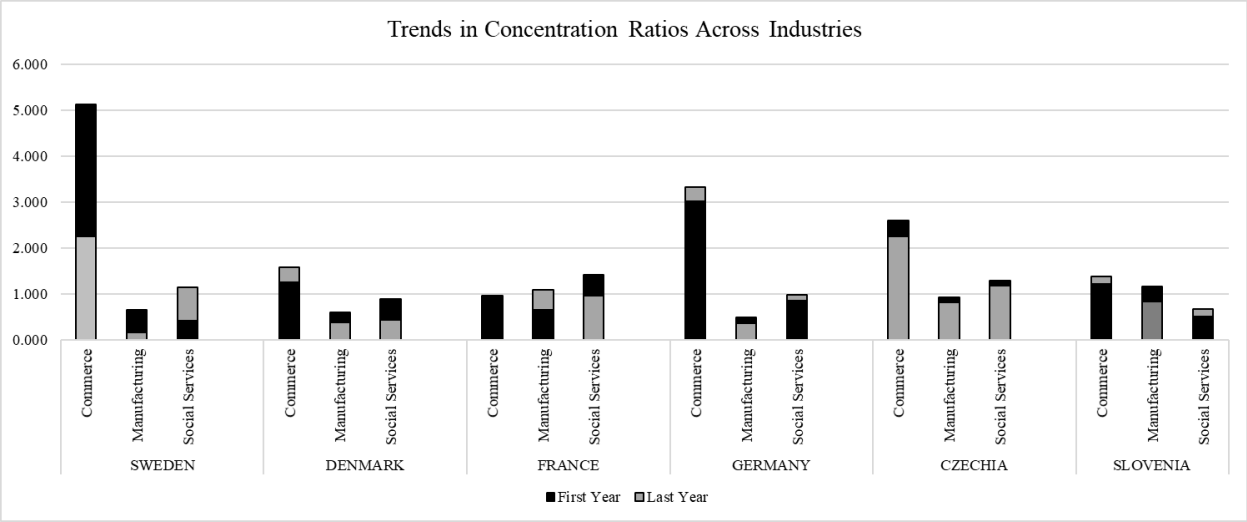

Figure 4: Concentration Ratios of low-wage work across selected industries for the first and last year available in each country.

Discussion

The bulk of research concerning both industrial relations and low-wage work has occurred at the national level. By exploring the strong linkage between sectoral differences in industrial relations and the concentration of low-wage jobs, this paper has aimed to show both the practical and theoretical importance of moving towards further studies at the sectoral level. Earlier research on low-wage work at the industry level concluded that low-wage work was highly concentrated in service sectors. Conversely, core industries usually located in manufacturing were more protected. In recent years, scholars have become aware of the strong heterogeneity of labor market institutions and job quality within the same industry across countries (Bechter et al. 2011; Bechter et al. 2012), as in Carre and Tilly's recent analysis of retail jobs across six countries (2017). Scholars have also shown that countries differ strongly in how much between-industry heterogeneity exists within a country. Some countries such as Denmark or France possess relatively homogenous industrial relations systems across sectors. Others, such as Germany or Czechia, diverge more strongly from industry to industry (Bechter et al. 2012). This paper used

high-quality administrative data to show that the relationship between industry and low-wage work varies strongly across countries, and that this variation is heavily conditioned by industry-specific industrial relations. An interesting finding here is that, even though the selected industries are not the same, countries with stronger between-industry heterogeneity in a study conducted by Bechter et al. 2012) also displayed sharper divergences in the industry-level concentration of low-wage work. For example, Sweden, a more institutionally heterogenous country than its neighboring Denmark, also consistently shows concentrations of low-wage work farther away from scores of 1 (representing exact proportionality) than Denmark does.

The importance of understanding the relationship between labor market institutions and low-wage work below the national level is further exemplified by the cases of Germany and France. A country such as Germany displays the typical pattern of earlier research. The continued strength of manufacturing unions and centralized bargaining, along with increased use of outsourced temp labor, has led to a stable, low level of low-wage work. In contrast, the German service sector has the highest concentration of low-wage work of any country examined here, likely the result of weak, poorly organized unions and the increasing preponderance of firms who have left collective bargaining altogether. France, on the other hand, was not marked by any strong industry divisions in low-wage work. The service sector, manufacturing, and social services all had relatively similar concentrations of low-wage jobs. In the French case, the relatively high national minimum wage likely serves to tamp down industry differences which might otherwise emerge. For example, collective bargaining agreements in some sectors routinely results in wages which are below the national minimum wage, at which point these wages are simply kicked up to the national wage (Caroli and Gautie 2008: pg. 47). In the absence of the national minimum wage, low-wage work would probably quickly concentrate into weakly

organized sectors (i.e. the service sectors). Future research should attempt to further disentangle the impact of various kinds of institutional and organizational changes on the industry-level distribution of low-wage work. For example, outsourcing and subcontracting processesare likely contributors of low-wage work not only in the “typical” vulnerable areas such as the service sector, but increasingly so in formerly protected industries such as “core” manufacturing workplaces.

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Supplementary Materials

Appendix 1: Country specific data sources, coding choices and limitations

A1.2 Data Sources and Sample Exclusions

For all countries, respondents aged 15 years and younger are excluded. In order to minimize reporting error and the influence of very short job spells, we also excluded very low earning jobs from each national sample. In all countries this was a very small proportion of the sample. Finally, establishments composed of only a single individual after the two previous exclusions are also dropped.

Czechia. Data were generated via the Average Earnings Information System (ISPV) survey conducted by the private agency TREXIMA for the Ministry of Labor and Social Affairs. The

data consists of the entire population of public sector workplaces, plus a sample of private sector workplaces. The private sector sample consists of workplaces with at least 10 employees. A stratified sampling of private sector workplaces with 10-250 employees were taken based on the size of the workplace. All private sector workplaces with over 250 employees are included in the data. There are no industry or sector restrictions. Those jobs which earned less than 50% of the minimum wage were removed, but in practice this eliminated barely any jobs. Estimates are weighted to produce national estimates.

Denmark. The data consists of population-level observations of both private and public sector workplaces and includes all primary and secondary jobs registered in November. All industries are included. Because Denmark does not have a national minimum wage, the bottom 5% of jobs were eliminated. Data were purchased from Statistics Denmark. Data are derived from the register-based workforce statistics (RAS) and population statistics (BEF) register source files.

France. Data were taken from the Annual Declaration of Social Data (DADS). Access to the DADS data was obtained through the CASD dedicated to researchers authorized by the French *Comité du secret statistique.* The data consists of population-level observations of private sector workers, plus all hospital and local civil service workers. State civil servants are missing. Jobs that report wages less than half of the hourly minimum wage are excluded, eliminating around 4% of person-job matches in each year.

Germany. Data comes from a customized sample for the project "Dynamics of organizational inequality: Investigation within the Comparative Organizational Inequality International Network (COIN)" of the Integrated Employment Biographies Sample (IEBS) of the Federal

Employment Agency. Our sample covers roughly 5% of the German working population and about 20,000 firms, spanning the years 1990-2015. Workplaces were first sampled, based on organizational size, and then information on all employee inside those workplaces were collected. In very large workplaces, a sample of 1000 workers were collected. The data includes all industries and sectors. Marginal jobs were defined as those which reported less than 450 euros per month. In practice, this resulted in very, very few jobs being removed. Because the German data is top-coded, an imputation strategy based on Card, Heining, and Kline (*21*) was used to impute top daily earnings. The method uses a tobit model that incorporates individual and workplace-specific components in the prediction equation. Estimates are weighted to produce national estimates.

Slovenia. Data were generated by the Statistical Office of the Republic of Slovenia. The data are population-level, including all sectors and industries. There were no marginal jobs in Slovenia, defined as wages below 50% of the annual minimum wage.

Sweden. Data were generated by Statistics Sweden and consists of a nearly population-level sample in which all sectors and industries are included. Private sector firms with less than 500 employees are sampled, but weights are used to adjust results. Following prior research, jobs that report monthly earnings less than 10,000 SEK are excluded. This eliminates less than 1% of person-job matches.

A1.3 Definitions of Marginal Jobs

We applied a wage cutoff of less than 50% of the minimum wage for countries with earnings measured in hours or days. In general, the jobs removed by our cutoff ranged from quite small to

almost none in our countries. The table below displays for first and last year observed the means, standard deviations, and sample sizes of each country for each sampling exclusion (total sample, excluding marginal jobs, and full-time only jobs).

Table S1: % Marginal Jobs Excluded Each Year

	Czechia	Denmark	France	Germany	Slovenia	Sweden
1993				0.003		
1994		0.		0.003		
1995		0.		0.005		
1996		0.	1.358	0.002		0.091
1997		0.	1.701	0.061		0.07
1998		0.	1.836	0.184		0.038
1999		0.	1.656	0.286	0.	0.023
2000		0.	1.578	0.337	0.	0.039
2001		0.	1.671	0.407	0.	0.023
2002	0.004	0.	1.115	0.419	0.	0.003
2003	0.039	0.	1.104	0.423	0.	0.
2004	0.046	0.	1.05	0.542	0.	0.
2005	0.042	0.	1.059	0.381	0.	0.
2006	0.112	0.	1.288	0.413	0.	0.
2007	0.128	0.	1.396	0.411	0.	0.
2008	0.073	0.	1.45	0.372	0.	0.019
2009	0.075	0.	1.707	0.468	0.	0.101
2010	0.064	0.	1.372	0.144	0.	0.091
2011	0.052	0.	1.811	0.225	0.	0.021
2012	0.042	0.		0.272	0.	0.018
2013	0.017	0.		0.322	0.	
2014	0.021				0.	
2015	0.029				0.	
2016	0.025					

Table S1: The percentage of jobs excluded from the final sample because they were below the marginal job threshold.

A1.4 Wage Concepts and Measures

For each country, we have tried to get as close to the hourly wage as is reasonably possible with the data at hand. All countries utilized some adjustment method to calculate hourly, daily,

weekly, or monthly earnings. The table below summarizes each country's wage concept, how they adjusted observed earnings, and their definition of "marginal jobs."

Table S2: Definitions of Earnings Concept, Full-time Employment, and Marginal Employment				
	Concept	**Observed**	**Adjusted**	**Def. of Marginal**
Czechia	Hourly Earnings	quarterly earnings	quarterly earnings / quarterly hours worked	Lower than half minimum wage
Denmark	Hourly Earnings	Yearly Earnings	Yearly Earnings / hours worked (categorical variable)	lowest half-decile were removed. Those who worked less than 20 hours a week were also removed
France	Hourly Earnings	Yearly Earnings	Yearly Wage/ Yearly # of Hours Worked	Less than 1/2 minimum hourly wage
Germany	Daily Earnings	Daily Earnings	N/A	Jobs which make less than 450 euro per month.
Slovenia	Monthly	Yearly Earnings	Contracted hours	Less than 1/2 minimum wage.
Sweden	Hourly Earnings	Monthly Earnings	Contract (% of FT)	Lower than 10K SEK monthly

Table S2: Country-specific definitions for earnings concepts, how they are initially observed in the data, and the transformation process. The definition for marginal jobs is also included.

CONCLUSION

In this dissertation, I have sought to examine two broad kinds of income inequality, between-workplace income inequality and the industry-level composition of low-wage employment. Both types of inequality have received recent attention from scholars and policymakers across a range of disciplines. Between-workplace income inequality has recently been shown to be the dominant driver of income inequality among rich, industrialized nations for at least the past several decades (Tomaskovic-Devey et al. 2020). Growth in between-workplace inequality among these countries seems to be almost ubiquitous, although countries vary in how strongly between-workplace inequality has grown. Low-wage work has likewise become more concerning to scholars and policymakers as many of these same countries have seen significant growths in their amount of low-wage employment (Boonstra 2012; Gautié and Schmitt 2010). At the same time, many rich, industrialized countries have seen significant transformations in many of their labor market institutions (Baccaro and Howell 2017; Marginson 2015; Thelen 2014; Leonardi and Pedersini 2018). In some countries, union density has rapidly declined, as has collective bargaining coverage. In other countries, the nature and content of bargaining contracts have been heavily decentralized, leaving increasingly larger room for workplace-level and individual bargaining to take root (Baccaro and Howell 2011; Baccaro and Howell 2017). Many European countries have relaxed regulations around temporary contracts and other forms of precarious, contingent labor (Emmenegger et al .2012). In some cases, institutions which in previous years might be expected to be linked to lower levels of income inequality may now, if anything, be either inequality-generating or at least no longer effective in reducing income inequality. Additionally, the decline of the manufacturing sector, a rising service sector, and growing trends in financialization and trade globalization have impacted most of these countries

to vary degrees. Altogether, this represents a radical shift in the shape of the economy and the institutions that regulate it.

The first chapter first focused on the relatively stable differences in between-workplace income inequality across countries. Although it is the case that almost every country in this study saw rises in between-workplace inequality, strong differences in the levels of between-workplace inequality that existed in the early 1990s (the general beginning of the data used here) were still present two decades later. Through fuzzy-set Qualitative Comparative Analysis (Ragin 2000), I tied these differences in between-workplace inequality levels to complex "packages" of multiple institutions. This kind of logic (familiar to anyone who has studies Welfare Regimes, varieties of capitalism, or other examples of interlocking institutional frameworks) stresses that outcomes are not driven by a singular institution (e.g. levels of collective bargaining coverage), but rather through the combination of multiple institutions. In the case of between-workplace inequality, countries with high levels of between-workplace inequality predominantly fit into a pattern related to a kind of labor market dualization. Countries tended to possess high levels of conflict and separate bargaining between unions, while also lacking the presence of more solidaristic institutions such as high levels of Employment Protection Legislation (EPL) for temporary workers or high collective bargaining coverage. The end result can be exemplified by countries like Germany or Hungary.

Germany is a classic example of a country with a strong, protected manufacturing core and an unorganized, weak service sector. Ideological divides and conflict between industrial and service sector unions has also characterized German organized labor for years. Concerning the minimum wage for example, service sector unions have long emphasized the need for a statutory minimum wage in Germany, whereas manufacturing unions long fought against it (although in

recent years this has changed, and of course Germany now has a legal minimum wage) (Thelen 2014; Schulten and Bispinck 2018). A consequence of this is that Germany has one of the strongest divides in incidence of low-wage work between manufacturing and service sectors like retail and hotels/restaurants (see Chapter 3) and an extremely high level of between-workplace inequality.

In Hungary, collective bargaining and other labor institutions have been under attack by several right-wing led governments since beginning its transition towards a market economy in the early 1990s. Collective bargaining coverage has significantly eroded over the decades. Lead actors in right-wing governments have also successfully pitted different unions against each other. In the public sector, for example, the government has intentionally favored certain workers and their unions over others in order to foment conflict within the wider labor movement. The end result is a weak and fractured labor movement with a great deal of conflict between unions. In such an environment, only unions in certain parts of the economy have had any success in bargaining effectively (Borbély and Neumann 2019).

In the second chapter, I first showed that many of institutional and economic changes listed above have played significant roles in the rising trend of between-workplace inequality. In most cases, these institutional and economic shifts had impacts on both between and within-workplace inequality, but effects on between-workplace inequality tended to be stronger. After establishing baseline relationships, I followed up on the interactional logic of Chapter 1 (albeit in a more conventional way) by modeling how certain institutional and economic trends (e.g. growing EPL dualization between regular and temporary contracts, trade globalization, financialization, growing service sectors, etc.) interacted with both collective bargaining coverage and union density (two linchpins of labor movement strength). The general takeaway here was that higher

levels of bargaining coverage, but especially union density, mitigated some of the between-workplace inequality-generating effects of items such as financialization, trade globalization, or larger service sectors.

Finally, the last chapter moved the focal point of the analysis from between-workplace inequality towards the issue of low-wage work, and the unit of analysis from the national level down to industry. Low-wage work has increasingly become concerning to scholars and policymakers as levels of low-wage work have grown in recent decades in most advanced, industrialized countries. By now, scholars have a good understanding of national levels of low-wage work (Gautié and Schmitt 2010). Liberalized, Anglo countries such as the United States or Canada tend to possess the highest rates of low-wage employment. The more solidaristic Scandinavian countries tend to possess the lowest. Countries in Continental and Eastern Europe tend to be sandwiched in the middle. Less is known about how the concentration of low-wage work across select industries can vary across countries. Previous research tended to suggest that manufacturing sectors possessed low levels of low-wage work, whereas service sectors (especially in areas like retail, hotels, or restaurants) tended to possess higher than average amounts of low-wage employment. In recent years, scholars in political economy, industrial relations, and related fields have shown the high level of variation in industrial relations systems that can exist within countries. The manufacturing and service sector in Germany, for example, scarcely resemble each other. I show the importance of mapping industrial relations and political economic systems at the industry, rather than the national, level by tying intra-national, between-industry variations in industrial relations to between-industry variations in low-wage employment. Low-wage work in countries Germany is overwhelmingly concentrated in service sectors precisely because labor actors in these areas are quite weak and labor actors in other areas

(e.g. manufacturing, certain segments of the public sector) are quite strong. In contract, the service sector in Slovenia has a much smaller concentration of low-wage employment at least in part because unions in these areas are strong. At the same time, national level institutions do still matter. French unions in the service sector are every bit as weak as the German ones, but a strong national minimum wage prevents low-wage employment from concentrating into services. Future research, not only on low-wage work but also between-workplace inequality and inequality more generally, should move away from unsatisfactory national-level pictures of industrial relations systems and fully take into account the kind of sector-by-sector variation in industrial relations that almost every country possesses (Bechter et al. 2011; Bechter et al. 2012).

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